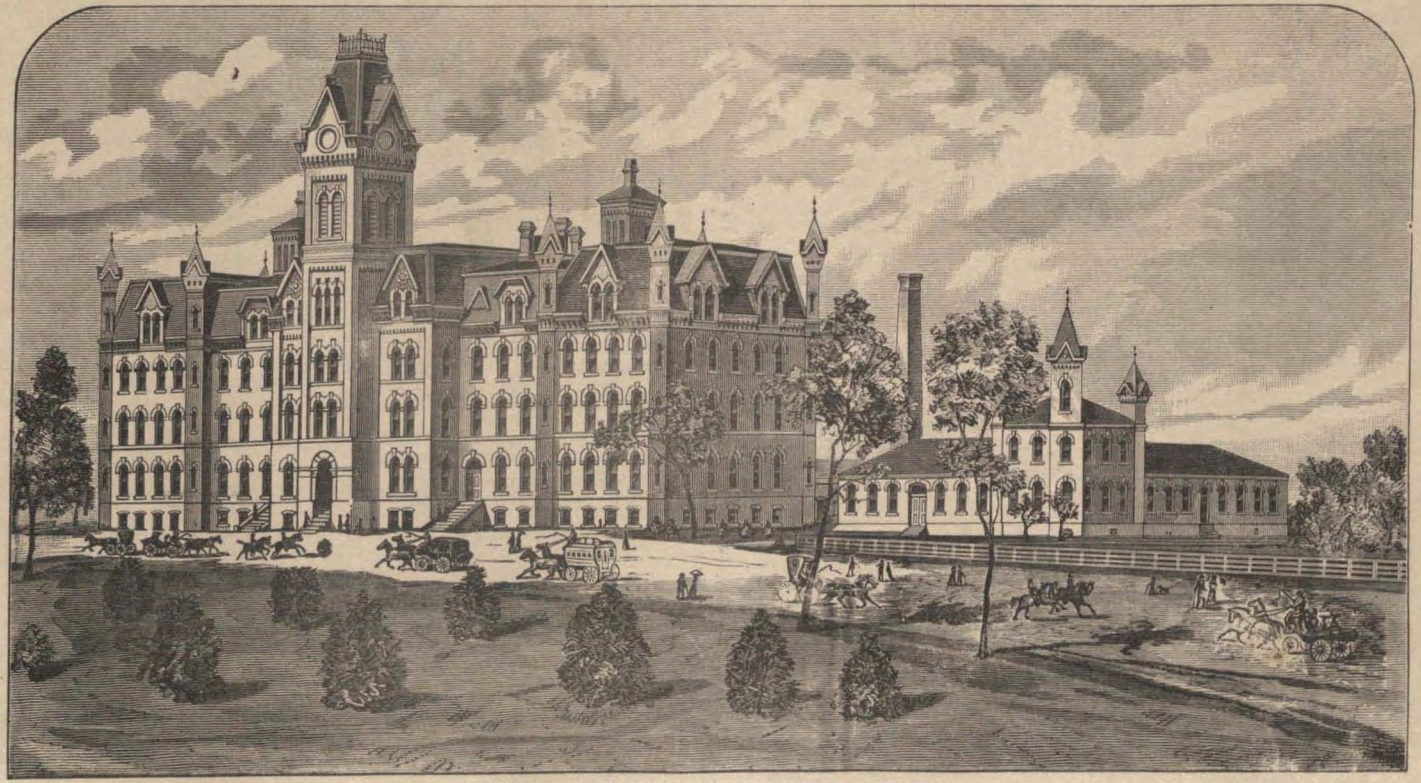

OHIO STATE UNIVERSITY.

# ELEVENTH ANNUAL REPORT

OF THE

# BOARD OF TRUSTEES

OF THE

# OHIO STATE UNIVERSITY,

TO THE

## Governor of the State of Ohio,

FOR THE YEAR 1881.

COLUMBUS:
G. J. BRAND & CO., STATE PRINTERS.
1882.

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## 1881-1882.

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COLUMBUS, OHIO, *November* 15, 1881.

*To His Excellency, Governor Charles Foster:*

SIR: I have the honor to transmit herewith the Eleventh Annual Report of the Board of Trustees of the Ohio State University, showing the condition and progress of the University.

Very respectfully,

Your obedient servant,

ALBERT ALLEN,

*Secretary of the Board.*

# REPORT OF TRUSTEES.

*Governor Charles Foster:*

SIR: The Trustees of the Ohio State University present herewith, as the law directs, a report showing the condition and progress of the Institution for the current year. They take pleasure in stating to your Excellency that the University is enjoying a well-marked and steadily-increasing prosperity, and that its condition is, in all respects, satisfactory and more promising than at the date of any other report. Nothing has occurred to mar its good order. Its departments have been strengthened and enlarged by additions to its professional corps, and by increased facilities for object instruction and illustration. Its material condition, also, as relates to the preservation and improvement of its buildings, inclosures, and farm appurtenances, is quite satisfactory. The number of students is much larger than heretofore, and its class and lecture-rooms are rapidly reaching the limits of their capacity.

The Board, in making this general announcement, would not have it understood that the University had reached its highest possible position, but rather that this increased prosperity should commend it to the more favorable attention of the State in its relations thereto. Upon the general demand of the people of the State, as was understood at the time, tuition fees were abolished early in the history of the college. While, therefore, an increase in the number of the students marks the growing service and usefulness of the University, it does not practically add anything to the Institution. On the contrary, by increasing the number of classes, and by more facilities for instruction, it actually adds to the burdens of the Institution. It is just here, in the judgment of the Trustees, where the State should lend its necessary aid. The endowment fund has been wisely husbanded, as all acknowledge. It has been so used as to attract, hold, and fit for useful positions, a valuable element of society from every section of the State. Now that it seems likely to call together more than it can properly serve, the State, in justice to herself, should supplement its capabilities by furnishing, at least, the necessary room for the education of its own children.

At the close of the collegiate year, June 20, 1878, Edward Orton, President of the University, offered his resignation. This action upon the part of President Orton was taken to relieve himself of the arduous responsibilities which the situation entailed, and to afford him more

time in the prosecution of his favorite pursuit, geology. In view of his ripe experience and able management through an honorable connection with the University from its beginning—his high scholarship and untiring zeal as an educator—the Board felt unwilling to part with his services, and his resignation was laid on the table for future consideration. His request, however, to be relieved has been renewed at the conclusion of each collegiate year since, and the Board felt impelled, by a deference to his wishes, to find a suitable successor. After investigating the fitness of several gentlemen of scholarly attainments and executive ability, the Board, at the regular meeting in June last, elected as President and Professor of Philosophy and Political Economy, Walter Q. Scott, of Easton, Pa., formerly of Ohio, a gentleman of rare intellectual endowments and culture, of unblemished character, and possessed of a general acquaintance with college government and educational wants. President Scott formally assumed the duties of his new position at the time of the last commencement.

The necessity of the ultimate separation of the subjects of Physics and Mechanics, which were formerly united, was obvious from the first, but, until the Institution had got into working order, it was thought best to have them associated. On Professor Mendenhall's withdrawal from the chair three years since to accept the Professorship of Physics in the Imperial University of Japan, Professor S. W. Robinson was called to the vacant Professorship. The special experience and acquirements of Professor Robinson led to a greater expansion and development of the mechanical division of the Professorship, and this was no sooner done than it became obvious to all that such broad subjects in an institution of the character of the Ohio State University, as Physics and Mechanics, could no longer be turned over to one man. Professor Mendenhall was accordingly invited, more than one year ago, to return to the University and assume the chair of Physics, while the department of Mechanics remains in charge of Professor Robinson. Professor Mendenhall is now at his post, and the Trustees believe that no change made by them during their administration will better serve all the interests concerned than this one. It has added great efficiency to both departments, and helps to maintain them, as they always should be, separate and central in place and importance.

The withdrawal by resignation of Prof. Joseph Milliken, so long and honorably connected with the University, as Professor of English Language and Literature, was rendered imperative, at the close of the last session, by reason of continued ill-health. The assignment of his work to other members of the faculty, whose departments are most

nearly related in scope, and which was rendered possible by the recent change in the presidency, guarantees the same high standard of excellence with which it has been heretofore marked.

With a view to the attainment of still greater proficiency in the Latin and Greek Languages, Professor Josiah R. Smith resigned his position to prosecute his studies in the Universities of Germany. The vacancy so occasioned has been filled by the appointment of Prof. S. C. Derby, late President of Antioch College, Ohio. Prof. Derby brings to this chair thorough scholarship, and a large experience in teaching.

From many considerations, independent of the chief design of Congress in making the land grant, it has been deemed essential to give the greatest prominence to instruction in scientific Agriculture and Horticulture. As the basis of all animal life, as the prime source of national wealth, and as an individual pursuit, the most healthful, independent, and attractive, Agriculture and Horticulture must always stand at the very *head* of all human industries. Every investigation tending to unfold for us the hidden forces of nature, and the laws of their operation, and the employment of artificial means, subsidiary to the highest productiveness, should receive the most careful attention. The isolation of the farmer—the engrossing nature of his labors—and his lack of proper facilities for conducting safe and reliable experimentation—clearly preclude his engaging in this work. It can only be done by the skilled Professor, whose *time*, *education*, and *facilities* can be commanded in the field, the forest and laboratory.

Under such convictions, and urged by the demand of many citizens and Agricultural and Horticultural Associations throughout the State, the board thought proper, in addition to the chair of Agriculture now held by Dr. Townshend, to create a new chair of Horticulture and Botany.

W. R. Lazenby, B. S., of Cornell University, whose scientific and *practical* information in relation to these subjects is well attested, has been called to this chair, and has entered with great energy upon the duties of this new and promising field.

In order to meet the requirements of this new department, a considerable outlay in the way of equipment will be required, and the board feels confident that it can appeal successfully to the Legislature for aid in this most practical and important direction. It also hopes for the cordial endorsement of your Excellency, in its proposed application, to the Legislature.

The long and successful administration of the Military Department of the University, by Lieutenant Luigi Lomia, having terminated by the expiration of the time for which he was detailed by the Secretary of

War, it became necessary for the board to make application for a successor. A considerable number of officers, with honorable record and strong credentials, made application to the board that their names be forwarded to the Secretary of War for appointment. In finally selecting First Lieut. George Ruhlen, 17th Infantry U. S. Army, as the officer for whom their application should be made, the Trustees were assured of a firm and manly, but quiet and unobtrusive management of this somewhat difficult office. They take pleasure in saying that thus far their expectations have been fully met, and the department, in all its divisions seems to be in harmonious and successful operation.

Under the provision of an act of Congress, passed February 26, 1879, allowing the President of the United States, upon the application of an established scientific school or college within the United States, to detail an officer from the engineer corps of the navy, as professor in such school or college, application was made by the Board September 23, 1881, to President Arthur for such detail. Documents attesting the scientific character of the University, accompanied the application, which was presented by the Hon. Geo. L. Converse, member of Congress from the 12th District of Ohio. An acknowledgment of the application by the President was duly received, stating that it had been referred by him to the Secretary of the Navy, and the Board is confident that the appointment will be made at an early day.

With the exceptions and additions just stated, the former corps of instructors remain intact. In the departments, however, of Mining and Metallurgy, Latin and Greek, and History and English Literature, the former assistant professors have been elevated to the rank of *full* professors. The subjects themselves, and the character of the incumbents of these departments, alike demanded this action. It is now confidently believed that no similar University can boast of a faculty superior in all that constitutes excellence in the line of both liberal and practical education.

In addition to the annual reports of the Institution which are published, and in part distributed by the State, the Trustees have deemed it their duty to further make known the advantages and opportunities which the University offers, by judicious newspaper advertising to a small extent, and by the distribution of circulars. These, during the summer vacation, have been largely scattered over the State.

The course of lectures, for farmers, on agricultural topics, was quite largely attended last winter, and every evidence of its high appreciation was received. Its continuance seems a fixed fact. While it imposes quite a burden on those members of the Faculty who are made responsi-

ble in conducting it, they are glad of an opportunity to thus popularize their several subjects and to establish closer connections between the farming community and the University.

The Board also made provision by which the University could be represented in the Farmers' Institutes, lately established under the auspices of the State Agricultural Society. Prof. Townshend was thus enabled to take part in a considerable number of these meetings, to the great satisfaction of the farmers assembled; and now already his services and those of Prof. Lazenby are being sought for in these Institutes during the coming season.

The main dormitory is still occupied by the University Club, numbering over fifty members, of orderly and good behavior. This use of the building happily serves to secure to those desiring the lowest possible rates, good board, good rooms and good care. The building was never as well kept as it is now; all unnecessary injury being promptly assessed by the club against the offending party. A good part of its successful management is due to the fortunate selection of the family in control of the house. The south dormitory is kept constantly full. It enables young men wishing to board themselves, to reduce their expenses to a minimum amount, and happily makes very full returns to the college.

During the last year an adequate and satisfactory water supply for the main building has been, for the first time, secured. The supply has been, heretofore, taken from cisterns and wells, and has proven so uncertain and precarious, as to subject the building to great inconvenience occasionally, and even to positive danger. Now, by the erection of a wind-mill, the strong spring to the south of the college has been utilized, and an abundant supply of good water is carried to the tanks and cisterns, at an expense not exceeding the interest on the original small investment. The work was planned and carried out by the professors of engineering in the college, Messrs. McFarland and Robinson.

The appropriation of $1,000, made by the Legislature in 1879–80, for cases in the Geological Museum, has been used during the last year, to the great advantage of the collection, as regards both its preservation and display. The material collected at such expense by the State Geological Survey is now made available for public instruction and service.

An appropriation of $1,000 for "ordinary repairs" was made by the last General Assembly. Advantage was taken of the summer vacation to paint the outside of all windows and doors, and the wood-work belonging to the roof finish, both of the college building and dormitory. The

bare exposure of the wood rendered these liable to rapid decay, and hence immediate attention was imperative. The more public portions of a part of the interior of the college, such as the halls and lecture-rooms, which were defaced, have been painted and kalsomined. Other essential repairs should be made, the cost of which can hardly be covered by this appropriation. Further provision should be made.

From the sale of Virginia Military lands to November 15, 1880, as shown by the Treasurer's report, the net proceeds were $17,134.71. Of this amount $12,073.28 was paid into the State Treasury to the credit of the Endowment Fund of the University, as provided by law. The net balance of $5,061.43 has been further increased during the last fiscal year by the addition, in gross, of $6,815.46. Of this latter sum $3,251.61 was derived from cash sales made during the year, and $3,563.85 from the collection of notes.

Charles A. Barton, of Portsmouth, Ohio, who was continued as Agent of the Board during the last year, has given much of his time to the details of making sales, discovering new lands, collecting notes, and recovering lands previously sold, the title to which had been forfeited by failure to comply with contracts of sale. There now remains unsold, principally in the counties of Adams and Pike, about 1,400 acres in small tracts, and as no new discoveries, to any great extent, seems probable, the fund to be derived from this source for the future will mainly depend on the collection of notes now held by the Treasurer.

The long standing claim of W. H. Leete, for services in connection with the Virginia Military Lands, under a former Board, has been, under the advice of the present Attorney-General, Geo. K. Nash, settled by the payment of $2,284.33 from the proceeds of the sale of these lands.

The question of building residences on the College lands, for the use of the Faculty, has frequently engaged the attention of the Trustees. In many obvious respects it would be most desirable to have the Professors located *near* the University. It has also been demonstrated by the rental received from the buildings already so located and occupied, that such additional residences would pay on the cost of their construction a rate of interest at least equal to that paid by the State on the general Endowment Fund. The use then of any interest-bearing funds belonging to the University for such building purpose, would not diminish the annual resources of the College. No portion, however, of the Endowment Fund or interest arising therefrom, can be so employed. The act, however, vesting the title of the Virginia Military lands ceded to Ohio by the act of Congress, in the Trustees of the Ohio State University, does not impose such prohibition. If the Legislature should, there-

fore, in their wisdom see proper to appropriate the proceeds of sales of these lands to this object, there would be nothing to prevent their so doing. Besides the amount heretofore certified into the Treasury under the requirements of the 6th section of an act passed April 3, 1873, by the General Assembly of Ohio, the report of the Treasurer will show that there remains in his hands the sum of $8,433.35. This sum, together with the amounts likely still to arise from sales and collections of notes, might be profitably and wisely invested in the manner indicated, and also *relieve* the State from the payment of interest on a fund not needed in its financial operations. No interest of the University could suffer by such an investment, while many of her more important ones would be greatly subserved.

As was suggested in the former portions of this report, there are certain directions in which the needs of the Institution are *urgent*, and for which *State aid* is earnestly called. The first of these is a want of room, which can only be met by the construction of one or more new buildings for the use of certain departments of the Institution. A chemical hall, with which also the mining and metallurgy could be associated, seems, on the whole, to be the most pressing want. This need not be an expensive structure; but for $20,000 a building could be erected that would provide ample room and the very best facilities for carrying on these important departments. The removal of two departments from the main building would release enough room there for some time to come. Unless some such provision is made the University will soon be obliged to close its doors against many applicants for admission—a result to be deprecated, and a State reproach.

The department of Botany and Horticulture needs also be provided for. Perhaps, as before indicated, no department of the University will be found more practical and directly serviceable to the State than this; and it is to be hoped that it will not be left hampered and undeveloped by the lack of the few thousands of dollars needed for its proper equipment.

For the fuller details connected with the condition, management, progress and wants of the University, your Excellency is respectfully referred to the appended special reports of the President and Faculty, the Treasurer, Farm Superintendent, and the minutes of the Board proceedings.

Respectfully, &c.,

ALBERT ALLEN,
*Secretary of Board.*

# REPORT OF THE PRESIDENT.

MR. T. EWING MILLER,

*President of the Board of Trustees of Ohio State University:*

DEAR SIR: I have the honor to present herewith the annual report of the Faculty for the year ending November 15th, 1881.

Inasmuch as only a few weeks have elapsed since I entered upon the duties of this office, the present report covers the transactions of the last year of the administration of my honored predecessor. The fact that the annual report is required at the close of the fiscal year of the University instead of at the close of the academic year, when the change of administration occurred, makes it my duty to present the official report of proceedings, whereof the responsibility and credit belong to the past administration. Indeed, circumstances incidental to the change of administration, have allowed me to devote only a short time to the consideration of details in the management of the University, and I therefore refrain from judgment upon any, except certain questions usually involved in an annual report of the Faculty.

But I may be permitted to express my great indebtedness to the hearty help of my colleagues in taking up executive work, and especially to the very thoughtful kindness of my esteemed predecessor, Professor Orton, who has done everything possible, both for the University and for his successor since he persuaded you to accept his resignation of the presidency in June last. The favorable opening of the present year is largely due to his efficient labor and care. The Institution is to be congratulated, not only upon securing the entire time of such a professor in the department of Geology, but also upon the fact that his experience as executive shall be constantly available in the councils of the Faculty.

The number of applicants for admission to the classes of the University at the opening of the present year was larger than at the opening of any previous year.

A general idea of the growth of the University may be obtained from the following summary:

| | | | | | | |
|---|---|---|---|---|---|---|
| In November, | 1873, | there were | 27 | students, from | 10 | counties. |
| " | 1874, | " | 59 | " | 22 | " |
| " | 1875, | " | 99 | " | 39 | " |
| " | 1876, | " | 120 | " | 42 | " |
| " | 1877, | " | 211 | " | 50 | " |
| " | 1878, | " | 198 | " | 52 | " |
| " | 1879, | " | 195 | " | 56 | " |
| " | 1880, | " | 235 | " | 61 | " |
| " | 1881, | " | 280 | " | 56 | " |

This last number, 280, includes those only that have been actually admitted and have paid their college dues.

A number of candidates were rejected, and while the standard was certainly not lowered, it cannot be said that the entrance examinations were in any case unreasonably severe.

The University desires to establish these departments of higher education upon such foundations as will afford the greatest advantages to the system of public schools, but it should be borne in mind by all concerned that it would be a gross perversion of the endowment of the State University to use any part of it in teaching what the State has already abundantly provided for in the common schools and high schools.

Our preparatory course of two years makes ample provision for all such candidates for collegiate classes as may have need to obtain preliminary training here rather than elsewhere.

I have not had the requisite opportunities of observing the working order of the students as distributed through the several departments during the past year, and therefore refrain from any generalizations based upon the statistical paragraphs in the professorial reports. These reports are, however, sufficiently clear in specifying the number of students engaged in the different studies of the curriculum. It will be observed that the distribution is, in general, wisely made, notwithstanding the large liberty of election enjoyed by the students. But it is also to be observed that the measures taken to fix the regular courses have been successfully forwarded without hindering the rightful privileges of choice afforded to those that may need or can pursue only special studies.

In this connection it is important to note that the present year opens with ampler provisions made by your honorable body for several departments of the University. I refer to them only in connection with the internal organization of the faculty.

You have established the department of Physics as a separate

department under Professor Mendenhall, and the department of Mechanics under Professor Robinson.

The appropriation made by the State for the department of Mechanics enabled you to accomplish this end, and it is doubtful if such a sum of money could have been used in any way to produce larger and better results in scientific education.

You have made provision for a thorough course in the English Language and Literature, and have established the chair of Philosophy and Political Economy. It has fallen to my hands to assist in the formation of the course in English, especially in that part which properly covers the Junior and Senior years. It is our attempt to give the most thorough training in the English language as a classic. To this end the critical study of Anglo-Saxon is taken up at the beginning of the Junior year when the preliminary training, not only in English, but also in the ancient and in the modern languages, can be directly applied to the work of mastering classic English with reference both to literature as a fine art and to the practical literatures of science and philosophy. The study of Anglo-Saxon is followed during two years by a critical study of the best English authors, according to the plan that will be found in the catalogue.

In regard to the chair of Philosophy and Political Economy, it constitutes an important part of your provision for the study of sciences concerning *Man*; which are last but not least in any complete course of education for the young. One hour daily, for two years, I hope to devote to the course in Philosophy and Political Economy. It will begin with the Junior year; two terms of which will be given to Psychology and one term to the History of Philosophy (Intellectual). Then Ethics will occupy the first term of the Senior year, Logic the second term, and Metaphysics (Intuition), with Political Economy the third term.

At the present time fifteen students are engaged in the studies of this department—seven in the junior class and eight in the senior.

You have also established the department of Horticulture and Botany. I beg leave to call particular attention to the accompanying report of Professor Lazenby. This department can be made very valuable to the State by an efficient equipment, which can be provided at a moderate expense.

The Agricultural interests of Ohio are certainly of prime importance, and a well-equipped department of Horticulture and Botany would go far toward completing the work which the State University ought to do in behalf of Agriculture. I need not urge upon your intelligence the

obvious fact that a suitable building, with necessary appliances, is indispensable even to the beginning of good work in this department. I cordially endorse the general aim of Professor Lazenby's report, and trust that the need will be supplied.

By reference to the report of Professor Townshend, it will be seen that the course of "Lectures to Farmers", delivered in January of the present year, was a marked success. Arrangements have already been made by which the faculty will present, if possible, a still better course in January next.

One hundred and sixty-four farmers attended the last course, who represented nearly half of the counties in the State. It is hoped that the advantages of these free lectures will be sought by a still larger number in January, 1882.

As to military drill, it gives me pleasure to report that the large number of new students have readily united with the old, and form a fine battalion. Comparatively few have sought to be permanently excused, and there appears to be a growing disposition to obtain the advantages of this valuable training. A physician's certificate of disability, and the want of means to purchase the uniform, are the principal grounds of excuse from drill. To require the able-bodied students to spend during the first two years, three quarters of an hour at noon in these admirable exercises, is in many ways a great gain to their manliness and to their scholastic training. In the natural growth of the organization of the University this military training will combine with the discipline of classes to produce an *esprit du corps* every way desirable, both for good government and for highest education.

The dormitories are in good condition, and at present all the available rooms are occupied. The demand for dormitory accommodations is greater than the supply, and an increasing number of students are compelled to seek rooms and boarding in private families.

In regard to the wants of the University, I have already emphasized the need of a building suitably equipped for the department of Horticulture and Botany.

But the obvious need of a legislative appropriation for this purpose does not diminish another great need which comes in fact from all the departments as the result of their growth. I feel, therefore, constrained to renew and urge the recommendation of President Orton in the report of last year in regard to a separate building for laboratories. The main building is now so crowded that the question of room is a serious problem. Already efficient work is hindered, not only in the laboratories,

but in at least seven other departmen s. While it may be fairly claimed that the University at present supplies the most varied and most thorough practical training in science to be had in the State, there can be no question of the great gain that would result if a separate building should be erected for laboratories.

I refrain from indications of plans or estimates, inasmuch as my brief experience of the working order of the institution does not enable me to speak wisely respecting details. But the report of Prof. Norton deserves careful attention in this direction, and doubtless the Board, together with the heads of departments, could select from several good plans one that would require a very moderate appropriation by which large practical benefits could at once be reached. The benefits of greatly augmenting the efficiency of work in the laboratories would certainly be equaled by the benefits of opening rooms in the main building for all other departments.

In this connection it is important to observe that the growing favor bestowed upon the University by the people of the State is increasing the number of students year by year, until now the pressure for room threatens to become a serious difficulty unless larger accommodations shall be provided. And it should be noted that this University, unlike most colleges, derives no income from tuition, and therefore the increase in the number of students really makes up additional burdens of expense, and constitues an important claim for enlarged equipment resting upon the pledged faith of the State.

Concerning lesser wants within the ordinary appropriations made by the Board, I recommend that immediate provision be made to assist Prof. Derby in the instruction of the preparatory classes in Latin. One of these classes contains fifty-four members, and it is not possible for any teacher to do good work in Latin with so large a class of beginners. Prof. Orton has kindly added to his work the teaching of the Latin class in the second preparatory year, and it has appeared to be impossible to make any better distribution of work, all hands being full. And it would be an obvious gain if Prof. Orton could be relieved of this class in Latin.

I also recommend that some additional desks, with necessary appliances, be provided for the department of Zoology and Comparative Anatomy. At a trifling cost Prof. Tuttle's lecture-room can be fitted with shutters so as to admit the use of the lantern in lecturing. This ought to be done.

Prof. Lord is preparing slides at his own expense for illustrating

lectures on Metallurgy. His room should likewise be provided with shutters.

The requests for books for the Library, coming from the several departments, are reasonable, and I trust that the Board may be able to increase this most valuable apparatus.

I shall hand to you a memorandum of other wants worthy of your attention.

I have the honor to remain,

Very respectfully, yours,

WALTER Q. SCOTT.

*Ohio State University, November* 15, 1881.

# DEPARTMENT REPORTS.

## DEPARTMENT OF GEOLOGY.

*President Walter Q. Scott:*

DEAR SIR: I present, herewith, the annual report of the department of Geology and of my own professional work, covering the calendar year ending November 15, 1881.

The work of the department is divided into two quite distinct branches, viz.: (1) instruction in the subjects included in it, and (2) the care of the museum attached to it. To these must also be added certain class-instruction outside of my department, that I have felt obliged to undertake in meeting the urgent needs of the institution. I will treat of these divisions of my work in the order indicated above.

1. The subjects of General Geology and Physical Geography now form part of the general and special courses leading to the various degrees of the College. The subject of General Geology occupies two terms in the Junior year of all the courses. These two terms are followed in the Engineering Courses by a third term, in which the subject of Economic Geology is taken up, including the Theory of Veins and the distribution of Metalliferous Deposits. The class in General Geology for the first two terms of the current year numbered thirty-one. The class of the present term numbers ten. The class in Economic Geology for the Spring term numbered three members.

The instruction in General Geology is given in part by lectures, and in part by text-book work. For the latter, Leconte's "Elements of Geology" is at present used. The subjects of Lithology and of Historical Geology are treated in lectures exclusively, and lectures are also introduced to supplement the other divisions of the subject. A little field-work is added to the other modes of giving instruction, but the demands of the various departments upon our students, and of other professorial work upon myself, render it impracticable to get enough consecutive time to undertake the various interesting geological problems that are within our reach. I am hoping to find a way by which some more extended work can be accomplished in this line. The scope of instruction in Paleontology, also, is quite limited, but enough is done to introduce the student to the methods of study and the general laws of this division of Geology.

The subject of Economic Geology is treated exclusively by lectures.

Physical Geography is now placed in the first term of the first year of the Preparatory Course. As a consequence, the classes in it are among the largest of the institution, and they are also, of necessity, the crudest. The work done is not quite as effective as when the study was reached at a later point in the course, but to some department must come the work of preparatory training, and perhaps this subject is as well fitted for an introductory one as any of the scientific studies that form a part

of the course. The bulk of the instruction is given by text-book, but a few lectures are interspersed with the recitations, which are made not only to extend the knowledge of the student beyond the text, but which also serve to acquaint him with a new method of gaining knowledge.

The class in Physical Geography of last year (1880), numbered sixty-eight; the entering class of the present term is as large as the preceding class, but by an arrangement with the Professor of History, who also gives instruction in the first year course, it has been divided into two sections, one taking up Physical Geography and the other United States History for the present term. Next term, the sections will change their work. The arrangement enables each Professor to teach both sections of his class, which would be scarcely possible if both sections pursued the subject in the same term. My section in Physical Geography for the fall term numbers thirty-two.

2. The Geological Museum is an important adjunct to the Department of Geology in the way of instruction, and it also constitutes one of the attractions of the University for the general public. A great improvement has been made in it during the last year by the re-arrangement of the specimens in the new cases, provided by a recent appropriation of the Legislature. The cases themselves leave little to be desired, so far as general service and adaptation to their work are concerned. For the plans and drawings used in their construction, even down to the minutest detail, I am indebted to Mr. Franklin C. Hill, the accomplished curator of the Geological Museum of the College of New Jersey, at Princeton, who has made a special study of this subject, and who has succeeded in combining the advantages of several excellent museum cases. The work of building the cases was executed with great fidelity and success by the Columbus Cabinet Company, of this city. A much better arrangement of the specimens has been secured than ever before, but there is still a large amount of good material that has not been properly provided for, and, in the case of the specimens that are displayed, there is a large amount of work to be done. In fact, the Museum demands a much greater amount of time than it has ever been possible to give to it. All such collections require the constant service of a curator, if they are to be maintained in a creditable condition, and above all if any adequate provision for their increase and expansion is to be considered. The appointment of separate a college officer for this work is not possible at present, and the duties must remain as heretofore in the hands of the professor, but it is only proper, in my judgment, that the curatorship shall be recognized as a constituent part of the duties of the department, for which adequate provision shall be made in the assignment of the time of the professor.

The cabinet has been increased during the year by a number of fine specimens of fossils and minerals, a few of which were purchased with the small appropriations made by the Board for this purpose, but the most of which were sent in as gifts by friends of the Institution. Among the donors I will mention: Hon. Andrew Roy, State Inspector of Mines; J. J. Janney, Columbus; Thomas Kelly, Special Agent of Tenth Census; Frederick W. Sperr, Special Agent of Tenth Census; C. C. Green, Middleport, O. The large geological map of the United States, recently issued by Professor C. H. Hitchcock, has also been added to the equipment of the department, and it proves very effective and useful.

3. Under the last head there remains to be reported four terms of work, in

classes outside of my own department, which I have felt constrained to take on account of the urgent needs of the Institution. These classes take time and force that my own department ought to have, and for the want of which it suffers to some extent. I shall be very glad when such provision can be made for these subjects as will exempt me from service "in foreign parts." The four classes named above number eighty-nine members in the aggregate. The subjects taught were in the departments of Latin and History, subjects in which the number or the size of the classes has required more service than the professors in these departments could possibly render.

The statements now made cover my professorial work for the year. The department has many wants, but I will call attention to but a single one, and that is the need of additional cases for the Geological Museum. The Legislature, two years ago, recognized the claims that were urged by us that the State should provide for the care and preservation of the materials which it had accumulated through the agency of the Geological Survey, and which it had committed to our keeping, and accordingly an appropriation of $1,000 was made for cases. This money has been used to great advantage, as has been already shown, but the amount was entirely below our estimates, and consequently it leaves the work but partly done. The appropriation should be supplemented by another of equal amount, and with this we could at least give safe-keeping to the valuable material that has been turned over to us.

Very respectfully yours,

EDWARD ORTON.

*Ohio State University, Nov.* 9, 1881.

# CHEMISTRY.

*Rev. Walter Q. Scott, President Ohio State University:*

DEAR SIR: I have the honor to present this, my Ninth Annual Report of the Chemical Department.

The class in general chemistry began the year with fifty-two students. Its recitations continued for two whole terms and a part of the third. Of these students thirty-seven continued in the class throughout the year. The present class, which began at the opening of the fall term, numbered at the outset fifty-two.

Of these, eight have already left the college for various reasons, many apparently not knowing their own mind when they enrolled their names.

The number enrolled in the laboratory during the past year was twenty-six. There are now enrolled twenty-two. The apparent falling off in numbers is due to the more rigid classification of our students, which has been adopted in place of a larger choice in elective studies. I believe the change to be a wise one, but I suggest that a course of study be arranged for the degree of analytical chemist. I am of the opinion that it might attract students who are looking to future work in iron works and other establishments requiring chemical knowledge. A few eastern colleges have arranged for such special course. It would be possible, with the resources of the University, to make such a course as extensive and thorough as can be required.

I am persuaded that it is for the welfare of the University to offer as many special courses as our facilities for instruction warrant. They may be regarded as so many different apprenticeships for future work of some sort, and will tend to prepare such students to make headway in the coming struggle of life. It is out of place here to estimate the so-called educational value of such special, and thereby one-sided courses. It may be granted that they do not fall into any theory of educational training; but such specialties are needed. We should do our part to equip them as well as may be profitable.

Our appliances for instruction in chemistry are increasing yearly. The most important recent addition has come from the opening of the large unused shaft of the west wing. By this has been secured a most admirable series of steam baths, and it is hoped a marked improvement in ventilation. The lecture-room in general chemistry can not easily be lighted nor ventilated. I most earnestly renew my suggestion for a new building. It might be so made as to include all the laboratories doing work in analytical chemistry, and also those which the University is likely to require in future. It is estimated that from $12,000 to $15,000 would be sufficient. Of course this is not on the basis of the highly endowed laboratories of Harvard or Princeton; but I should be content with unplastered walls, if only the conveniences for work were abundantly furnished. I hope that this matter will receive favorable attention from the Board.

I ask that $80.00 be appropriated for books in the department—specially to buy Fresenius's Zeitschrift for analytical chemistry—and a few recent publications.

As soon as the funds devoted to books warrant, we should buy Liebig's Annalen ( $400.00 ), and other chemical journals. We have now a current subscription to the Journal of the Chemical Society ; the back numbers should be purchased. I desire this Journal continued, and would also like the others mentioned above, in all, three, viz.: Journal of the Chemical Society, London; Liebig's Annalen ; Fresenius's Zeitschrift für Analytische Chemie.

The work done during the past year will compare favorably with that of former years. We had, in fact, a much larger proportion of advanced chemical students than has been usual. This year we have but six second-year students.

As the laboratory is conducted, it is the least expensive to students that I know of anywhere. The entire expense for a whole year need not exceed forty dollars. Only one other institution in the State has any pretensions for doing work in chemistry as extensive and thorough as is contemplated in our plan of study. The methods employed in teaching the science of chemistry have been given in ample detail in former reports. It has not been found necessary to change the general plans, but, of course, the new discoveries find their proper place, and the attempt is made to keep abreast with the development of the science.—We do less in organic chemistry than I wish, but we do not retain our students long enough to do much in that branch of the science, and I regret to say that we have had few applicants.

Dr. Orton, in his last report, advised the appointment of an Assistant Professor in Agricultural Chemistry. I repeat his recommendation, and hope that favorable action may be taken upon it. If such an assistant should be appointed, he might be put in charge of all that relates to organic chemistry and be, in fact, "Professor of Organic Chemistry and of its relations to Agriculture." We have had, so far, but two students desiring agricultural chemistry, but I have no doubt that others would apply if special provision was made for them.

David O'Brine, B. S., continues his work as assistant in chemistry. He has had full charge of the laboratory accounts, and has rendered valuable service in caring for the details which are required for the laboratory. Very few realize how much labor is necessary to keep a large laboratory in efficient working order, and I take this opportunity to express my personal obligation to him for cheerful co-operation and faithful assistance.

Respectfully submitted. SIDNEY A. NORTON.

*November* 1, 1881.

# DEPARTMENT OF AGRICULTURE.

OHIO STATE UNIVERSITY, *November* 1, 1881.

*Rev. W. Q. Scott, A. M., President:*

DEAR SIR: I beg leave to make the following report of work done during the past year in the Department of Agriculture, including also Veterinary Science and Economic Botany.

The class in Agriculture numbered twelve, the class in Veterinary Science eleven, and the class in Economic Botany eight. In all of these classes satisfactory progress was made. At the present time Junior Agriculture has a class of seven, Senior Agriculture a class of five, and Veterinary Science a class of five. The students in Veterinary Science have enjoyed the advantages of a free Veterinary Clinic, held weekly, which has given them an opportunity of seeing many common forms of animal disease and of observing methods of examination and treatment.

The report of the Farm Superintendent will give in detail the results of experiments made upon the University Farm under my direction.

The third course of "Lectures to Farmers," given in January of the present year by professors of the University, proved a gratifying success. One hundred and sixty-four visitors were in attendance, representing nearly half the counties of the State. At the close of the lectures the desire was unanimously expressed for a similar course in 1882.

Very respectfully,

N. S. TOWNSHEND,
*Professor of Agriculture.*

# DEPARTMENT OF MATHEMATICS AND CIVIL ENGINEERING.

OHIO STATE UNIVERSITY, COLUMBUS, O., *November* 1, 1881.

*Walter Q. Scott, President:*

DEAR SIR: I have the honor to make the following report touching the work done in this department for the year closing October 31, 1881. The number of students in the several classes is given by sessions:

Fall Term, 1880—Engineering, 6; Surveying, 19; Geometry, 24; Algebra, 84.

Winter Term, 1881—Engineering, 9; Surveying, 17; Geometry, 49; Algebra, 89.

Spring term, 1881—Engineering, 9; Astronomy, 26; Trigonometry, 38.

Fall Term, 1881—Engineering, 19; Surveying, 36; Geometry, 32; Analytical Geometry, 28; Algebra, 1st section, 56. Total, 541.

The work in all the studies has been, in general, satisfactory.

Field-work, for the classes in engineering, is carried on in the fall and spring terms, every day, when the weather permits. It consists in leveling, measuring heights and distances, surveying, setting out curves, cross-sectioning, mapping with the plane table; in fine, practicing in almost every variety of work pertaining to the business of the engineer.

In the winter session, when field-work is ordinarily impracticable, the classes are instructed in all kinds of drawing pertaining to engineers' work, viz.: platting, isometric, axonometric and topographic drawing; shades and shadows, and the general principles of perspective.

The telescope mentioned in my last annual report has been received from the manufacturers, Alvan Clark & Sons.

Very respectfully submitted.

R. W. MCFARLAND,
*Prof. of Mathematics and Civil Engineering.*

## DEPARTMENT OF ZOOLOGY AND COMPARATIVE ANATOMY.

*Rev. Walter Q. Scott, President:*

DEAR SIR: I have the honor to submit to you my eighth annual report.

During the year which has recently closed, the number of students in the various classes in my department was as follows:

| | |
|---|---|
| Elementary Physiology | 24 |
| Comparative Anatomy | 1 |
| Advanced Physiology | 8 |
| Making a total enrollment for the department of | 33 |

The changes in the courses of study adopted by the Faculty two years ago, making the work of my department, during the year in question, lighter than usual in previous years or probable in those to come, I took temporary charge also of the First Preparatory English (55), which I have not, of course, counted in the enrollment of my department.

The enrollment for the current term is as follows:

| | |
|---|---|
| Elementary Physiology | 50 |
| Advanced Physiology | 12 |

I have, in addition charge, for this year, of one section of First Preparatory English, numbering twenty-six students.

No change was made last year in any of the text-books used in this department. I am using this year Huxley's Elementary Physiology in place of Cleland's, and have substituted Mivart's Anatomy, Frey's Histology, and Sanderson's Syllabus of Physiology, for the one large work by Foster, previously used by advanced students in Anatomy and Physiology. I shall also use Packard's Zoölogy during the second and third terms of the year.

I am glad to be able to report that some slight provision has at last been made for practical instruction in Advanced Physiology. The appropriation made by the Trustees one year ago, of four hundred dollars, provided desks for twelve students and apparatus and other appliances for such instruction in Chemical Physiology only for six. The result has been that this year every desk is taken, and several excellent students have been turned aside for want of more desk room. The increased attendance in this department makes an increase of the present stock of apparatus, absolutely necessary, and a further extension of the facilities of this department very desirable.

I must again urge our need of new skeletons of man and of the domestic animals. Seven years of constant use has reduced those now in our possession to a condition that is discreditable to the University.

I would be glad to have suitable provision made for the suitable exhibition of specimens, demonstrations, preparations, etc., on a properly constructed lecture-table, as well as for such appliances as will enable me to use my stereopticon and oxy-hydrogen microscope for the benefit of the large elementary classes.

An appropriation of fifteen hundred dollars would meet the various wants that I have indicated, and would, I am confident, be more than repaid in the resulting advancement of the welfare of the students in this department.

All of which is respectfully submitted.

ALBERT H. TUTTLE,
*Prof. Zoölogy and Comp. Anatomy.*

*State University, Nov.* 1, 1881.

# DEPARTMENT OF MECHANICS.

OHIO STATE UNIVERSITY, *November* 8, 1881.

*President W. Q. Scott:*

DEAR SIR: I respectfully present the following report of work in the Mechanical Department, during last year, and so far for the present term this year:

Students in the several branches of the fall term, last year, 1880: Analytical Mechanics, 6; passed, 4; Thermodynamics, 1; Mechanical Laboratory, 14; passed, 10.

Winter Term, 1881—Mechanism, 5; passed, 5; Strength of Materials, 2; passed, 2; Prime Movers, 1; Mechanics and Machinery, 1; Mechanical Laboratory, 17; passed, 14.

Spring Term, 1881—Mechanism, 4; passed, 4; Millwork, 1; Mechanical Laboratory, 14; passed, 9.

Fall Term, 1881—Analytical Mechanics, 3; Machine Drawing, 3; Mechanical Laboratory 14; Thermodynamics, 2.

A considerable need has been felt during the past year, and previously, for more standard books and works of reference in the library, treating upon subjects of the departments. The two libraries of the city are not always serviceable, for two reasons—first, the distance; second, the absence of needed books. A few of these needed books placed in our library would be a relief.

The practical operations of the Mechanical Laboratory have heretofore consisted mostly of exercises in the use of tools. This has been favored for two reasons—first, because this kind of instruction is needful; and second, because demanded by the greatest number. The laboratory should, however, be furnished with facilities for practical exercises of a higher order, such as a dynamometric brake applicable to our steam engine for measuring the power developed by it; an iron tank into which the engine can exhaust its steam for a time, to be condensed to determine the heat leaving the engine; a machine for testing lubricating oils; a machine for testing the strength and elasticity of materials by various methods of test; means for measuring the temperature of fire, smoke and steam. The present testing machine is well adapted only for direct tension and compression, for determining ultimate resistances, whereas the elastic resistance cannot be obtained by means furnished in our machine; but which is of importance even greater than the ultimate resistance, both for building purposes, and for instruction's sake. I believe it very desirable that the present testing machine be exchanged for another, supplying the desired conveniences. As soon as means can be allowed for securing the important instruction just indicated, I shall be glad to procure exact figures for the same. Three of the testing machines desired would cost in the neighborhood of $300 each, the old testing machine being turned in besides as part pay for a new one in its place. These testing machines may be placed in the first story, corner room, of the Mechanical Laboratory building.

Some additional specimens have been added during the year to the Mechanical Cabinet; also, models of mechanical movements.

## DEPARTMENT OF PHYSICS.

During the fall of 1880, and the winter and spring of 1881, the Physical Laboratory was under my charge; also, the higher class in physics. The elements of physics were taught by an instructor.

The class in higher Physics during the Fall Term, 1880· Higher class, principles of Physics, 4; passed, 3; Physical Laboratory, 1.

Winter Term, 1881—Physical Laboratory, 4; passed, 3.

Spring Term, 1881—Physical Laboratory, 2; passed, 2.

Very respectfully, yours,

S. W. ROBINSON.

# DEPARTMENT OF MINING AND METALLURGY.

*Rev. W. Q. Scott, President:*

DEAR SIR: I have the honor to present the following report on the work of the department of Mining and Metallurgy for the past year: During the year there were ten students in the advanced work of the department; one of those completing his course received the degree of Mining Engineer.

The Freshman class in Mineralogy numbered twenty-two, making the total number of students in the department thirty-two.

The present term opens with eight students in the advanced studies—Metallurgy and Assaying.

I have also the charge of one of the divisions of the first preparatory English class—twenty-seven students.

The work of the State Laboratory has been regularly carried on, and has been about the usual amount. During the summer a large number of fertilizers were analyzed for the State Board of Agriculture, and the results published in their reports.

It is hoped that during the present year time may be found for carrying on some metallurgical experiments which shall give the work of this department more general value still. The Metallurgical Laboratory needs to be protected by a wall drain, or some such means, from the dampness, which is at times a very serious annoyance and risk to those working there.

I would ask an appropriation of at least two hundred dollars for my department for the purchase of new minerals and specimens. We need, badly, a students' collection of minerals—specimens which can be handled and tested by the members of the class.

I am at present making arrangements for having made, at my own expense, a set of lantern slides illustrative of the lectures on Metallurgy. I therefore ask that the windows of my lecture-room be provided with dark shutters or curtains, that I may be able to use the lantern there.

Respectfully submitted.

N. W. LORD,
*Professor of Mining and Metallurgy.*

# DEPARTMENT OF HISTORY AND ENGLISH.

OHIO STATE UNIVERSITY, COLUMBUS, *Nov.* 7, 1881.

*President Walter Q. Scott:*

DEAR SIR: I have the honor to submit a report of the work in my department during the College year of 1880–1881. The class rolls for that period make the following exhibit:

*First Term.*

| | | |
|---|---|---|
| Advanced History | 14 | |
| Psychology | 6 | |
| Total | | 20 |

*Second Term.*

| | | |
|---|---|---|
| Advanced History | 9 | |
| Philosophy | 4 | |
| U. S. Elementary History | 30 | |
| Total | | 43 |

*Third Term.*

| | | |
|---|---|---|
| Advanced U. S. Constitutional History | 12 | |
| Ethics | 8 | |
| General History | 35 | |
| Total | | 55 |
| Total class enumeration for the year | | 113 |
| Section of U. S. Elementary History, taught in Winter term by Prof. Orton | | 22 |
| Section of General History, taught in Spring term by Prof. Orton | | 30 |
| Total of classes in History and Philosophy | | 165 |

Deducting thirty-three for students counted more than once, one hundred and thirty-two will remain as the net total of attendance upon the department for the year.

In addition to the above I taught a class of eighty in Abbott's "How to Write Clearly," once a week throughout the first and second terms, and nearly half as many during the third term. The division of the class, so necessary to its success, was made possible by Professor Lord taking a section of it in the Spring term.

In the advanced History the work was perceptibly furthered through the expenditure of a small appropriation made for my department. The few books thus obtained proved a decided stimulus to the habit of special research, which it is the aim

of the department to cultivate. Yet, I shall not attempt to conceal the truth that the highest success of the department is rendered impossible by the neglect to place within the reach of students a limited number of important works on History and Political Science.

The special European History taught in the first and second terms of the year, embraced a study of the institutional and constitutional growth of the leading Powers, from the fifth century until the present. The text of Hallam's Middle Ages, used in the first term, was supplemented by lectures on the languages, literature, learning, law, commerce, agriculture, condition of labor, and domestic life of the period; also, by a course on the English constitution. The text-book on Modern History was followed at the close of the winter term by a course of lectures on the "Condition and Policy of the Great Powers in 1880." Professor Mason contributed to the completeness of the work in each subject by illustrated lectures on the History of Architecture for both periods.

In the spring term, the Constitutional History and Civil Polity of the United States was taught by means of a course of lectures; and a system of references (1) to the original documents, and (2) to the leading expository and historical writers on the subject. One recitation hour per week, throughout the year, was devoted to the reading and criticism of theses in Historical and Political Science.

Allow me to allude, in this connection, to what is, doubtless, patent to all, that it is incumbent upon us, as a State institution, to give thorough and special instruction in the Constitutional History of both the General and the State governments, to as large a number of our students as possible. It is important that we prepare all who seek our tuition, in some degree for the duties of citizenship. Such training in a broad sense is provided and given to those who choose two out of seven of the courses laid down in our curriculum. May not a more general provision for the body of our students be made at an early day?

In Philosophy, the work of the first term, relating to presentative and representative knowledge was enlarged by a course of lectures on the "Relation of Mind and Body," illustrated in the light of physiological research. In addition to the text-book work of the second term, extended courses of lectures on the Emotions and Will, and on the history of Philosophy were given.

The third term was devoted to the principles and history of Ethics, taught both by the text-books and lectures.

With the present term I entered, in part, upon the duties incident to the re-adjustment of departments by which English was committed to me in place of Philosophy. In the practical outcarrying of the change I have had such hearty coöperation from yourself as calls for my grateful acknowledgments. My work in English for this term has been performed in connection with the Senior Rhetoric, a daily class of twenty-one, and a section of the Second Preparatory Composition and Rhetoric, a class, in weekly recitation, numbering thirty-eight students; another section of which is taught by Miss Williams.

It would be premature to present, in this connection, a prospectus of the work contemplated in English. Suffice it to say, that no effort will be spared for the realization of the most sanguine wishes entertained by yourself and the Trustees for the eminent success of the department. May not the augury of such realization be read

in the following transcript from my rolls, for the present term, made interesting by the size of the advanced classes?

1. Junior (advanced) History..... 21
2. Senior Rhetoric..... 21
3. United States Elementary History (1st section)..... 23
4. Second Preparatory Rhetoric and Composition (1st section, weekly)... 38

Respectfully submitted.

JOHN T. SHORT,
*Professor of History and English.*

# DEPARTMENT OF LATIN AND GREEK LANGUAGES.

OHIO STATE UNIVERSITY, COLUMBUS, O., *November* 1, 1881.

*To President W. Q. Scott:*

DEAR SIR: I respectfully submit the following report upon the Department of Latin and Greek, which has been under my charge since the beginning of the current academic year.

The number of students at present members of the various classes in Latin and Greek, is as follows:

| | | |
|---|---|---|
| Sophomore Latin | 7 | |
| Freshman Latin | 14 | |
| Second Preparatory Latin | 25 | |
| First Preparatory Latin | 54 | |
| | | 100 |
| Junior Greek | 2 | |
| Sophomore Greek | 9 | |
| Freshman Greek | 7 | |
| | | 18 |
| | | 118 |
| Twice counted | | 7 |
| Net total | | 111 |
| Net total corresponding term of 1880 | | 92 |
| Gain in number | | 19 |

The instruction of the Second Preparatory Class was kindly undertaken by Prof. Orton.

The classes in Junior Greek and Freshman Greek, entrusted respectively to Miss Belle Swickard and Mr. C. C. Miller, have been taught with a good degree of fidelity and success.

I have reserved for myself four classes, viz.: First Preparatory Latin, Freshman Latin, Sophomore Latin and Sophomore Greek, each class having five recitations a week. In addition, I have assumed the instruction in Grammar of one section of the First Preparatory Class in English—a weekly exercise.

I would press upon your attention and the consideration of the Board of Trustees the urgent need of dividing the First Preparatoay Class in Latin into two sections, each of which, with our present number, will be as large as can be properly taught in one class, or be decently accommodated in any recitation room at the disposal of the department.

Very respectfully yours,

S. C. DERBY.

# DEPARTMENT OF BOTANY AND HORTICULTURE.

*Walter Q. Scott, A. M., President Ohio State University:*

DEAR SIR: Scarcely more than six weeks have elapsed since I first assumed the duties of the department of which I now have charge, and this fact will explain why the present report is but little more than a prospectus.

Early in the term a committee of the Faculty was appointed to so arrange the studies of the agricultural course as to include more Botany and a year's work in Horticulture. After due consideration the following scheme of study was decided upon for this department:

PREPARATORY COURSE.

Third Term—Structural and Systematic Botany.

COLLEGE COURSE (*Second Year.*)

First Term—Economic Botany.
Second Term—Physiological Botany.
Third Term—Special Botany, Gramineae, etc.

COLLEGE COURSE (*Third Year.*)

First Term—Cryptogamic Botany, Ferns, Fungi, etc.

COLLEGE COURSE (*Third Year.*)

First Term—{ General Principles of Horticulture. / Fruit Culture.
Second Term—{ Vegetable Gardening and Seed Growing. / Arboriculture and Practical Forestry.
Third Term—{ Practical Floriculture. / Landscape Gardening.

In accordance with this arrangement I am teaching three classes the present term, viz.:

One of 10 students in Economic Botany.
One of 7 students in Fruit Culture.
One of 4 students in Special Botany.

The instruction in Economic Botany consists of lectures and recitations supplemented by field-work and class excursions. The appended "synopsis" will indicate the scope of instruction in Fruit Culture, which is farther supplemented by practice in the laboratory and observations in the orchard and gardens. I am happy to report that thus far all of the students in the department have manifested a lively interest in their studies, and are doing good, honest, faithful work.

It is also due the department to state, that each of the classes would have been increased at least one-third by elective students, but for conflict of hours with required studies.

The present condition of the gardens, orchard, and whatever pertains to the different out-door divisions of the department, will, I doubt not, be reported by Prof. Townshend or Mr. Thorne, under whose management they have been during the past year.

For the future I am impelled to make the following suggestions:

1. That the department of Botany and Horticulture be entirely separate and distinct from the department of Agriculture. This is absolutely essential to success. Several years of experience in each of these departments, together with pains-taking study and observation of the history of similar departments in different institutions, have fully convinced me of this. I would, therefore, respectfully suggest that at as early a date as practicable an equable division of land, teams, implements, etc., be made, and that each department thereafter keep its own accounts and manage its own affairs independently. This is the only way by which the two departments can work together with satisfaction to themselves or credit to the University.

2. I would recommend that the plat of land lying between the main University building and the President's house—which is now enclosed and not considered as a part of the campus—be devoted to an experimental garden and nursery.

3. That hereafter the experimental fruit-garden be devoted to fruit *alone*, and that no attempt be made to raise vegetables or grain therein.

4. That a portion of the campus in the vicinity of the "lake" be devoted to a botanic garden.

In my judgment, the most essential requisites of success in this department are well-managed fruit and vegetable gardens, a small, but well-stocked nursery of fruit, forest and ornamental trees and plants, and a good botanic garden. Without them the practical operations of Horticulture cannot be illustrated or made familiar.

Aside from their use as a means of instruction, why should not most of the trees, shrubs, and flowers needed to beautify and adorn the grounds be furnished by this department, rather than purchased elsewhere.

The University grounds already contain a fine collection of trees and shrubs, but we should have a genuine arboretum, where *all* varieties that will live in this climate could be found correctly labeled, so that their habits of growth, and value as timber or ornamental plants, could be seen and noted.

Before mentioning the needs of the department, I would call attention to the fact that, for several years past, the utter want of facilities for any horticultural instruction at the University has been the subject of equally just and severe criticism. Not a dollar has been appropriated by the State for this vitally important purpose. The department, as it stands to-day, has scarcely a single appliance—even such as the humblest nurseryman, fruit-culturist, or florist is obliged to secure in order to commence his operations. There may have been good reasons why this is the case, but they no longer exist. It is high time, in this age of universal progress, that this department do something. If it does not advance with the rest, it will fall irretrievably behind. Give it but the means to accomplish its purpose, and its influence will soon be felt in all pertaining to Horticulture. May we not hope that the las may become first, by securing a more generous appropriation than it was possible to obtain in the early history of our University, when the needs of other departments were even greater than is now the need of this.

The imperative needs of the department are as follows:

1. In order to do efficient work, and make the department really useful in the way of instruction and experimentation, we require a separate building dedicated to Botany and Horticulture. Upon the first floor of this building there should be a well-furnished class-room and suitably appointed laboratories; also, an office and seed-room. The second story should contain the museum and store-rooms. There should be a capacious frost-proof basement for the storage of fruit and garden products, for stocks, root-grafts, etc., for the nursery, and rooms where many of the practical horticultural operations could be carried on. Such a building can be erected and properly equipped for about ten thousand dollars.

2. We need a neat, well-constructed greenhouse—not an expensive conservatory—but a structure adapted to the propagation and preservation of plants for study by the students of Botany, for the raising of bedding plants for the college grounds, and for raising cuttings and seedlings of fruits, ornamental plants, vegetables, etc., needed in the garden and nursery. Such a structure is also necessary merely to illustrate the subject of plant-culture under glass. It should be erected in connection with the building above mentioned, and constructed in the most approved modern style, with the best heating apparatus. The cost should not exceed five thousand dollars.

3. We need a dwelling-house for the Professor of Botany and Horticulture.

At present the alternative is to live in a manner neither convenient nor economical, or else be so far removed from work as to be unable to give it the personal attention it demands.

Some minor, though none the less necessary wants, are the following:

1. An assortment of botanical paper for pressing, mounting and preserving plants. A suitable supply for immediate necessities can be secured for about $25.

2. Six dissecting microscopes, $50.

3. A pair of balances for weighing small quantities of seed, $25.

4. A case for herbarium and botanical models in south-east corner of class room, estimated cost, $75.

5. A sink, with proper fixtures, in the north-east corner of botanical class room, where there already is a water-supply and waste-pipe, estimated cost, $8.

6. An assortment of stakes and labels for out-door experiments, $10.

7. An assortment of horticultural hand-tools, budding-knives, grafting implements, pruning shears, etc., $10.

8. A small assortment of chemical re-agents, alcohol, poisons, etc., for preserving specimens; also, a few funnels, beakers, jars, bottles, etc., $10.

9. Four zinc trays for testing seeds, $8.

The above wants are not simply desirable, but absolutely indispensable. If they are not supplied, it is impossible to do anything like thoroughly good work.

I am proud of the State of Ohio, proud of its resources, still prouder of its horticultural possibilities. I live in the joyful trust that this department of the Ohio State University shall soon receive such substantial aid and encouragement, that it can do something toward developing these possibilities, and that through its influence Horticulture may be impelled toward a perfection of which few have hardly dared to dream.

Respectfully submitted.

WILLIAM R. LAZENBY,
*Prof. of Botany and Horticulture.*

*Ohio State University, November* 4, 1881.

# DEPARTMENT OF MILITARY SCIENCE AND TACTICS.

OHIO STATE UNIVERSITY, COLUMBUS, O., *Nov.* 9, 1881.

*Rev. Walter Q. Scott, President Ohio State University:*

SIR: I have the honor to submit herewith my report to you, of the Military Department of the Ohio State University.

I assumed charge of this Department at the beginning of the present term, and have now one hundred and seventy-one students enrolled and under practical instruction in military drill. While the students who entered the institution this year were being prepared in the "School of the Soldier," the others, who had received practical instruction under my predecessor, were exercised in company and skirmish drill and in the manual of the piece in artillery. When the new students had made sufficient progress in the drill, I organized a battalion of three companies, and a band or drum corps of fourteen members. The officers and sergeants of the battalion are as follows:

*Staff*—

Horace Allen, 1st Lieutenant and Adjutant.
H. K. Terry, 2d Lieutenant and Quartermaster.
D. S. Gaskell, Sergeant-Major.
Edward Orton, jr., Band Leader.
C. C. Allen, Quartermaster-Sergeant.

*Company "A"*—

Captain—M. N. Mix, commanding.
1st Lieutenant—J. R. Lovejoy.
2d Lieutenant—Wm. Neil.
1st Sergeant—C. C. Miller.
Sergeants—Winfield Scott, J. N. Conoway and L. A. Hine.

*Company "D"*—

Captain—E. O. Ackerman, commanding.
1st Lieutenant—C. S. Amy.
1st Sergeant—F. L. Allcott.
Sergeants—M. T. Dozer, W. L. Kiger, Wm. D. House.

*Company "B"*—

1st Lieutenant—James T. Anderson, commanding.
1st Lieutenant—F. M. Allen.
2d Lieutenant—D. F. Snyder.
1st Sergeant—W. S. Devol.
Sergeants—M. P. Kenney, Harry B. Peters and J. D. Streeper.

These companies are now being drilled in the school of the company. It is also my intention to give practical instruction in battalion movements, skirmish drill, parades, reviews and inspections, as soon as sufficient progress has been made in the

company drill to make these battalion manœuvres practicable. The duties of guards and sentinels are also being taught practically and theoretically. The class in tactics comprises twenty-one students, and five attend the lectures in military science.

Recognizing the fact that the object of giving military instruction to the students of the University is not so much to make soldiers of them as it is to train these young men in habits of obedience to fixed rules, of neatness of personal appearance, quickness of perception and promptness in execution of orders, as well as to give them a physical exercise which tends to impart ease and grace to the movements of the body, I have thus far endeavored to shape my course in such a manner as has seemed to me most likely to accomplish these ends. I have hitherto not only met with no opposition, but I have had the sympathy and co-operation of the great majority of those under my direction in the military department. Nearly all who take part in the drill manifest an earnestness of purpose and an interest in it which is very encouraging to me, and which I hope to be able to keep alive throughout the year.

I desire here, also, to express my high appreciation of the efficient services rendered by the senior officers, appointed by my predecessor, namely, Captains M. N. Mix and E. O. Ackerman, and Lieutenants James T. Anderson, late Adjutant, and F. M. Allen, late Quartermaster, in the performance of the duties with which they were charged previous to the organization of the present battalion.

DEPARTMENT OF MATHEMATICS.

In this department I hold, by appointment of the Board of Trustees, the position of Assistant Professor—the department being in charge of Prof. McFarland. I have two classes, one being a division of the first preparatory class in algebra, and consisting of thirty-one students, and the other, a portion of the second preparatory class in geometry, numbering thirty-five students. With a few individual exceptions my class in algebra is doing well, while the progress of my class in geometry is beyond my expectations. The backwardness of the few students referred to in the class in algebra, is due to want of proper preparation in the introductory parts of this branch of mathematics and inability to make up this deficiency, and at the same time keep up with the class to which they belong.

I am, sir, very respectfully,

GEORGE RUHLEN,

*1st Lieut. 17th U. S. Infantry, Prof. Military Science and Tactics, and Assistant Professor of Mathematics.*

# DEPARTMENT OF INDUSTRIAL ART.

OHIO STATE UNIVERSITY, COLUMBUS, *November* 1, 1881.

*Rev. W. Q. Scott, President:*

DEAR SIR: I have the honor to present my second annual report for the department of Mechanical and Free-hand Drawing.

The following is a statement of the number of students pursuing the two studies —Mechanical and Free-hand Drawing during the college year 1880–1881:

*First Term.*

| | |
|---|---|
| Mechanical Drawing | 13 |
| Free-hand Drawing | 42 |

*Second Term.*

| | |
|---|---|
| Free-hand Drawing | 50 |

*Third Term.*

| | |
|---|---|
| Free-hand Drawing | 40 |
| | 145 |
| Twice counted | 35 |
| Net total for year | 110 |

The present term shows a marked increase in the number of students. In the Mechanical Drawing class there are at present studying and practicing Projection Drawing, 30 students; an increase of one hundred per cent. over last year. In the Free-hand class 45 students avail themselves of the advantages of the studio.

Free-hand Drawing is not required in any course in the University, except a very limited amount—two hours each week in the Freshman year. The studio, however, is open to any student of the University who desires to occupy in this manner any odd hour, though not to the detriment of his regular studies. Drawing is taken as one of the three regular studies by a number of students—twenty the present term; although it is not recognized as one of the required studies for any degree. Drawing, therefore, being in this elective condition, an evil arises which is perhaps irremediable—that of the irregularity of students' hours; precluding all class lectures. Principles of drawing and coloring are explained in the studio individually to pupils.

Besides the elementary students in Free-hand Drawing there are the following advanced students (included in the enumeration) pursuing higher branches, viz.: five in water color drawing; three in oil painting; one in clay modeling, and five in crayon portraits.

I have also one student in Architectural Drawing. I am pleased to have some interest shown in this study, and will cheerfully welcome others who desire to study in the same direction. I have purchased a series of Architectural plates, and should more students join the class in the future, other copies might be needed. I would I would also suggest that more advanced drawing casts are needed for the advanced students.

I have taken the authority to order one life-size bust, but earnestly desire that a few more may be purchased.

To cover expenses of this nature, I respectfully request that the sum of $50 be appropriated for the ensuing year.

I gratefully acknowledge the sum appropriated for the department last year.

Very respectfully,

W. A. Mason, Jr.,
*Assistant Professor Industrial Art.*

# DEPARTMENT OF FRENCH AND GERMAN.

OHIO STATE UNIVERSITY, *November* 7, 1881.

*President Scott:*

SIR: I have the honor to submit the following annual report of the French and German classes.

The course of study in these languages continues through two years; hence, there are two classes every year in each language. The number in the several classes now is:

| | |
|---|---|
| Sophomore French | 14 |
| Freshman French | 31 |
| 2d Prepar. German | 22 |
| 1st Prepar. German | 41 |
| Total number | 108 |

This is certainly a good per cent. of the number of students now in the University, and when the number in the second-year classes is compared with that of preceding years, it will be seen that there is a good increase in the number that continue the study through the second year. This increase indicates not only that the regular and complete courses of study are more generally accepted, but also that the usefulness of a knowledge of these languages is now better understood than heretofore.

The following table shows the recitations received per week by these classes:

| | |
|---|---|
| Sophomore French | 2 per week. |
| Freshman French | 5 " |
| 2d Prepar. German | 5 " |
| 1st Prepar. German | 5 " |

making daily recitations for all but the Sophomore French. Until the beginning of the present term this class also had daily recitations; at this time it was thought advisable to add another year of Physics to the curriculum, but as the daily programme was already somewhat crowded, and as the branch to be added was to be included in the regular college courses, it was necessary that some other branch of study should share its time with this new one. The Sophomore French having been selected as the one to undergo this limitation, its recitations per week were fixed as shown by the table. As to the results of this change I am not at present prepared to speak; there has not yet been time enough elapse since the change to judge it properly. Before taking up the subject of the method pursued in the study of these languages, I would speak of an idea that exists in this country in regard to the study of modern languages. It is this: The study of a modern language is easy; therefore, but a short time is needed to acquire as skillful a use of it as one "to the manner born." Some, therefore, to the learning of one devote three, others not quite so sure of their talents in this direction, will devote six months; but as to two years—

the length of time usually given in colleges to this study—as to two years, why, as regards the amount of knowledge the usual American thinks he can attain in that time, his two years must be made to equal five or ten years of the European. But it is now time to recognize the fact, that no average college student, whose attention is divided among several branches of study, can, even in two years, acquire a perfect knowledge of any language. He would not expect to become a perfect geologist, a perfect chemist, or a perfect anything else in that time, and he must not expect to become a perfect linguist, even in his own tongue. He can learn much, but not all. Where two years only can be given to such study, during the first year the foundation for a knowledge of it should be prepared. This should consist of the ability to read it with tolerable ease, and the most careful study of the principles on which the construction of the language rests. Then, during the second year, the student should be taught to apply these principles by composing in the language; this gives skill in writing it, and no knowledge of a language is practical without this ability. Having gained this much, to converse in it becomes comparatively an easy matter, for in order to compose in a language one must *think* in it, and, of course, no one can speak a language readily who does not think in it. Another thing—when once the ability to read and write a language readily, is acquired, it is rarely forgotten, but the ability to speak it, without the former knowledge, is soon lost when one is where the language is not in common use. Some attention should be given also in the second year to the literature of the language, in order to awaken in the student a desire for a fuller study of it. That such attention, when carefully conducted, rarely fails in its object, I have had many proofs. This, then, is a partial explanation of the method pursued in these two languages. In addition to the classes mentioned I have charge, for this year only, of a section of the Preparatory Rhetoric. This class now numbers thirty, and recites once a week. It was feared that, coming so seldom, it would be difficult to keep the class interested in its work, but the interest that is manifested to make the most of the time by acquiring as much knowledge of the subject as possible is very encouraging.

The classes described in the above report are making, so far as I can reasonably judge, good progress in their work.

Very respectfully,

ALICE K. WILLIAMS,
*Instructor French and German.*

# CIRCULAR AND CATALOGUE.

# FACULTY.

REV. WALTER Q. SCOTT, A. M.,
President and Professor of Philosophy and Political Economy.

EDWARD ORTON, PH. D., LL. D.,
Professor of Geology.

SIDNEY A. NORTON, PH. D., LL. D.,
Professor of General and Applied Chemistry.

NORTON S. TOWNSHEND, M. D.,
Professor of Agriculture and Veterinary Science.

R. W. McFARLAND, A. M., LL. D.
Professor of Mathematics and Civil Engineering.

ALBERT H. TUTTLE, M. SC.,
Professor of Zoology and Comparative Anatomy.

S. W. ROBINSON, C. E.,
Professor of Mechanics.

T. C. MENDENHALL, PH. D.,
Professor of Physics.

NAT. W. LORD, E. M.,
Professor of Mining and Metallurgy.

JOHN T. SHORT, PH. D.,
Professor of History and the English Language and Literature.

S. C. DERBY, A. M.,
Professor of the Latin and Greek Languages.

WILLIAM R. LAZENBY, AG. B.,
Professor of Horticulture and Botany.

GEORGE RUHLEN,
First Lieut. 17th Infantry, U. S. A., Professor of Military Science and Tactics, and Assistant Professor of Mathematics.

WILLIAM A. MASON, JR.,
Assistant Professor of Industrial Art.

ALICE WILLIAMS,
Instructor in the French and German Languages.

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S. C. DERBY, A. M.,
Librarian.

BELLE SWICKARD,
Assistant Librarian.

## STUDENT ASSISTANTS.

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CHARLES M. LEWIS,
CHARLES C. MILLER,
BELLE SWICKARD,

Assistants in Latin and Greek.

DAVID O'BRINE,

Assistant in Chemistry.

HORACE L. WILGUS,

Assistant in Mathematics.

WILLIAM K. CHERRYHOLMES, B. S.,

Assistant in Zoology.

NEWTON M. ANDERSON,
FREDERICK KEEFER,
WILLIS S. JONES,

Assistants in Physics.

# ORGANIZATION AND EQUIPMENT.

The Ohio State University is founded on the Congressional land grant of July, 1862. By that act a large amount of the public land was turned over to the several States, the proceeds of the sales to be devoted to the better education of the industrial classes. The share of each State was proportioned to its representation in the National Legislature, and thus six hundred and thirty thousand acres came into the possession of Ohio. This munificent gift was unfortunately pressed for sale upon a temporarily overstocked market, and the State realized only fifty-four cents to the acre. The total amount of the sales ($342,450) was, however, put at interest, and when the institution was opened, in September, 1873, the principal and interest together constituted a productive fund of something over $500,000, which has since been increased to a small extent, until an annual income of $34,000.00 has been reached.

The Legislature having passed an act to authorize the several counties of the State to raise money to secure the location of the University, an offer of $300,000 from Franklin county was accepted by the Board of Trustees, and the University was permanently located at Columbus. The money furnished by Franklin county has been mainly expended in the three following items: 1. The purchase of a valuable farm of three hundred and thirty acres within the corporate limits of the city of Columbus. 2. The erection of a spacious and elegant college building, and two dormitories for students. 3. The equipment of the various departments of instruction in the University.

The total value of endowment and property at the present time exceeds $1,000,000.

The departments already established, and the provisions made for giving instruction in them, are as follows:

### I. PHYSICS.

For this subject ample provision has been made in the equipment of the institution. It is safe to say that, in the opportunities afforded for thorough study in it, the University already surpasses most of the institutions of the country. Its laboratory is supplied with expensive and well-selected apparatus, designed not only for illustration, but also for original research in all the leading divisions of the science. Students are directed to its use in the way of original investigation as soon as they are properly prepared to undertake such work.

### II. CHEMISTRY.

The course in General Chemistry provides instruction in pure science, developing the theories and laws in order, and illustrating them by an extended suite of experiments. This course is supplemented by an important series of lectures on the applications of Chemistry to the Arts.

The course in Analytical Chemistry provides full instruction in all departments of the science. In connection with the ordinary work of Qualitative Chemistry, the student is taught the use of the spectroscope, and of the blow-pipe in Determinative Mineralogy.

The course in Quantitative Chemistry includes both the volumetric and the gravimetric methods. The student will also be assisted in any special branch of the science that he may desire, and take up in detail topics which relate to pharmacy, medicine, agriculture, and other sciences in which the principles of Chemistry are applied.

### III. ZOOLOGY AND COMPARATIVE ANATOMY.

The subjects of Zoology and Comparative Anatomy constitute a distinct professorship, and means have been provided for making the instruction in this subject thorough, practical and extensive. A large amount of material, selected with special reference to its availability in teaching, has already been accumulated.

A dissecting-room, with good facilities for the study of veterinary anatomy, is also furnished, while for practical training in microscopy there have been supplied eight microscope stands, representing all the principal modes of construction, and nineteen objectives, giving powers up to 2,500 diameters.

A Physiological Laboratory is now established, which is supplied with apparatus for the quantitative determination of several of the more important animal functions. It constitutes an important and timely addition to the means of instruction furnished by this department.

### IV. BOTANY AND HORTICULTURE.

These subjects, comprising the scientific and practical sides of the study of the vegetable kingdom, have recently been combined in a separate department, and extended and thorough instruction in them has already been begun.

### V. GEOLOGY.

The University is able to present unusual advantages for the study of Geology. By act of the Legislature it has been put in possession of all the collections made by the late State Geological Survey, and these collections have been supplemented by valuable additions of fossils and minerals from various sources The State collection embraces a very complete representation of every geological formation shown in Ohio.

### VI. AGRICULTURE.

The department of Agriculture, which also includes the *diseases of animals* and their *medical and surgical treatment*, is provided for in a distinct professorship, the aim of which is to acquaint the student with the theory and practice of a truly rational system in this most important field. The course extends through two years, and is rendered practical by being constantly connected with the work that is carried on upon the farm. Numerous opportunities are afforded to the students in veterinary medicine of observing the treatment of diseased animals.

VII. MATHEMATICS.

Under the two professorships that divide the work of Mathematics between them, a full course of instruction is provided for, including also the subject of Astronomy. A term is given to Trigonometry, and one term is given to each of the three subjects, Analytical Geometry, the Differential and the Integral Calculus. The work of several other departments, especially Civil Engineering, Physics and Mechanics, and Chemistry, require the constant and practical application of the knowledge acquired in mathematical study.

VIII. DRAWING AND DESIGN.

Instruction in these subjects is provided in the University, and all needful facilities are furnished by which those who wish may acquire skill in these several departments of art. Drawing is made a prominent element in the education of all students in engineering.

IX. CIVIL ENGINEERING.

This course, which extends through two years, includes surveying, location, and construction of roads and railroads, construction of bridges, strength of materials, geodesy, etc. The time of one professor is chiefly devoted to this department. Field-work is extensive and varied, for the execution of which a full set of engineering instruments of the finest construction is provided.

X. MINING ENGINEERING.

This department is now in successful operation, and classes are established in the several branches belonging to it. The mining of coal and the manufacture and working of iron are recognized as leading subjects in it, but full courses of instruction are offered in general metallurgy. The department is well equipped, both for instruction and practical work.

XI. MECHANICAL ENGINEERING.

The University is able to offer excellent advantages in this important subject. A mechanical laboratory has been established, and is in successful operation. The Russian system of hand-training has been introduced, which insures the imparting of a measure of practical skill, together with theoretical instruction.

XII. MILITARY SCIENCE AND TACTICS.

In accordance with an act of Congress, an officer of the United States army has been detailed by the War Department to give instruction in the subjects named above. An extended course of lectures and recitations in Military Science is offered to such students as desire it, while thorough training in military drill is made obligatory upon all male students, except such as are excused on reasonable grounds.

XIII. FRENCH AND GERMAN LANGUAGES.

In the organization of the University, special prominence is given to the modern languages, as all who expect to attain any good degree of proficiency in the natural sciences must certainly acquaint themselves with French and German.

These languages can be pursued in courses as extensive as the needs of the student may require.

### XIV. LATIN AND GREEK LANGUAGES.

Ample provision is also made for the study of the Latin and Greek languages, not only in compliance with those terms of the organic law of the University which forbid the exclusion of classical studies, and which declare one of the aims of the institution thus endowed to be "the liberal education of the industrial classes," but also because of the great advantage which such study gives in acquiring a thorough knowledge of our own and other modern languages; and, in the last place, but not the least important, because of the relations which they bear to literary, historical, and scientific studies.

### XV. PHILOSOPHY AND POLITICAL ECONOMY.

The course in Philosophy extends through the Junior and Senior years. The Junior Year is devoted to Psychology and the History of Philosophy; the Senior year to Ethics, Logic, Metaphysics, and Political Economy. All these subjects are taught by text-books. The students work up the topics by examining their own minds, by searching the best authors, and by weekly essays and discussions which are required from each student.

### XVI. HISTORY AND ENGLISH.

Extended courses in both subjects are provided. Three years of work in advanced History are afforded to candidates for the degree of Bachelor of Philosophy. The last of these, a course in United States Constitutional History and Civil Polity, is included in the courses for the degrees of B. A. and B. Sc.

In English Language and Literature the course extends through the last three college years. In the the Sophomore year, two terms are devoted to the Art of Discourse and one term to the study of words. In the Junior year, English, as a classic, is taken up. Beginning in the study of the Anglo-Saxon, it includes the critical reading of texts according to the methods employed with Latin and Greek, and a historical survey of the body of our literature.

The subjects are taught both by text-books and lectures, and the student is trained as far as possible to habits of independent research.

# DEGREES AND COURSES OF STUDY.

The University offers three general degrees, viz.: Bachelor of Arts (A.B.), Bachelor of Philosophy (Ph.B.), and Bachelor of Science (B.Sc.). It also offers four special degrees, viz.: Civil Engineer (C.E.), Mining Engineer (M.E.), Mechanical Engineer (Mech. Eng.), and Bachelor of Agriculture (B.Ag.).

In addition to these degrees, certificates of work done in the several departments will be granted, as hereafter stated.

The courses of study which lead to the above-named degrees can be learned from the following statements and schedules.

A Preparatory Course of two years' duration is provided for those students who enter the University directly from the common or district schools. This course includes the ordinary studies of the better grade of the high schools of the State. It is expected that the graduates of these schools can sustain examination in the entire Preparatory Course, and enter directly upon proper college work.

The Preparatory Course is shown in the following schedule:

## PREPARATORY COURSE.

### FIRST YEAR.

First Term—Algebra, from Quadratics; Physical Geography; Latin or German.

Second Term—Algebra completed; United States History; Latin or German.

Third Term—Botany; General History; Latin or German.

Exercises in English Grammar and Composition one hour each week throughout the year.

### SECOND YEAR.

First Term—Geometry; Human Physiology; Latin or German.

Second Term—Geometry completed; Physics; Latin or German.

Third Term—Trigonometry; Physics; Latin or German.

Exercises in Rhetoric and English Composition one hour each week throughout the year.

Either Latin or German, as named above, is to be chosen for a two years' course. Students looking forward to the degree of Bachelor of Arts, or to the degree of Bachelor of Philosophy, will take Latin; candidates for other degrees will take German.

*Text-Books*—Algebra, *Loomis;* Geometry, *Loomis;* Trigonometry, *Loomis;* Physical Geography, *Guyot;* Human Physiology, *Huxley;* United States History, *Eliot;* General History, *Freeman;* Botany, *Wood;* Physics, *Norton.*

The text-books in Latin and German will be found under the heads of these departments on a subsequent page.

## GENERAL AND TECHNICAL COURSES.

In the following schedules the studies required for the several degrees of the University are named. The character and amount of the work done in each can be further learned from the detailed statements in regard to the departments that follow the schedules. It will be observed that a considerable amount of the work is common to the several courses, and, further, that this common work is made, for the most part, synchronistic in the courses.

## (A.) GENERAL COURSES.

FOR THE DEGREE OF BACHELOR OF ARTS.

*Freshman Year.*

| | | | |
|---|---|---|---|
| First Term. | Latin, *Livy.* | Greek, *White's Lessons.* | Chemistry, *Norton.* |
| Second Term. | Latin, *Tacitus.* | Greek, *Lessons and Anabasis, Book I.* | Chemistry, *Norton.* |
| Third Term. | Latin, *Horace, Odes.* | Greek, *Anabasis, Books II and III.* | Chemistry, 2-5, *Lectures.*<br>Mineralogy, 3-5, *Dana.* |

Free-hand Drawing two hours each week throughout the year.

*Sophomore Year.*

| | | | |
|---|---|---|---|
| First Term. | Latin, *Horace, Satires*, 3.<br>English, *Art of Discourse Day*, 2. | Greek, *Memorabilia and Phaedon*, 3.<br>Physics, *Ganot*, 3. | Botany, *Lectures*, 2.<br>Zoology, *Packard*, 3. |
| Second Term. | Latin, *Tacitus, Histories.*<br>English, *Art of Discourse Day*, 2. | Greek, *Herodotus' Selections*, 3.<br>Physics, *Ganot*, 3. | Zoology, *Packard*, 3.<br>Botany, *Lectures*, 2. |
| Third Term. | Latin, *Plautus, Quintilian.*<br>English, 2.<br>Study of words, French. | Greek, *Homer*, 3.<br>Physics, *Ganot*, 3. | Zoology, *Packard*, 3.<br>Botany, *Lectures*, 2. |

*Junior Year.*

| | | | |
|---|---|---|---|
| First Term. | Psychology, *Porter*, 3.<br>Anglo-Saxon, *March's Gram. and Reader*, 2. | Greek, *Euripides*, 3.<br>Latin, 2. | Geology, *Le Conte*, 2. |
| Second Term. | Psychology, *Porter*, 3.<br>Chaucer, *Marsh's method*, 2. | Greek, *Sophocles*, 3.<br>Latin, 2. | Geology, *Le Conte*, 3.<br>Astronomy, 2. |
| Third Term. | History of Philosophy, *Schwegler*, 3.<br>Shakespeare, *Marsh's method*, 2. | Greek, *Demosthenes*, 3.<br>Latin, 2. | Astronomy, *Loomis*, 3.<br>Geology, 2. |

*Senior Year.*

| | | | |
|---|---|---|---|
| First Term. | Ethics, *Bascom.* | Greek, 3.<br>English Literature, 2. | Constitutional History, 2.<br>Elective course in Science for the year. |
| Second Term. | Logic, *Jevon's.*<br>Political Economy. | Greek, 3<br>English Literature, 2. | |
| Third Term. | Metaphysic.<br>Political Economy. | Greek, 3.<br>English Literature, 2. | |

FOR THE DEGREE OF BACHELOR OF PHILOSOPHY.

*Freshman Year.*

| | | | |
|---|---|---|---|
| First Term. | Latin, *Livy.* | French, *Grammar, Duffet.* | Chemistry, *Norton.* |
| Second Term. | Latin, *Cicero.* | French, *Masson's Classics* | Chemistry, *Norton.* |
| Third Term. | Latin, *Horace.* | French, *Masson's Classics* | Chemistry, 2-5, *Lectures.* Mineralogy, 3-5, *Dana.* |

Free-hand Drawing two hours each week throughout the year.

*Sophomore Year.*

| | | | |
|---|---|---|---|
| First Term. | Latin, *Horace*, 3.<br>English, *Art of Discourse, Day*, 2. | Physics, *Ganot*, 3.<br>French, *Moliere*, 2. | Zoology, *Packard*, 3.<br>Botany, *Lectures*, 2. |
| Second Term. | Latin, *Tacitus*, 3.<br>English, *Art of Discourse, Day*, 2. | Physics, *Ganot*, 3.<br>French, *Corneille*, 2. | Zoology, *Packard*, 3.<br>Botany, *Lectures*, 2. |
| Third Term. | Latin, *Plautus, etc.*, 3.<br>English, *Study of Words, Trench* 2. | Physics, *Ganot*, 3.<br>French, *Feuillet*, 2. | Zoology, 3.<br>Botany, *Lectures*, 2. |

*Junior Year.*

| | | | |
|---|---|---|---|
| First Term. | Psychology, *Porter*, 3.<br>Anglo-Saxon, *March's Gram. and Reader.* 2. | History, 3.<br>Latin, 2. | Geology, *LeConte*, 5. |
| Second Term. | Psychology, *Porter*, 2.<br>Chaucer, *March's Met.*2. | History, 3.<br>Latin, 2. | Geology, *LeConte*, 5.<br>Astronomy, *Loomis*, 2. |
| Third Term. | History of Philos'phy, *Schwegler*, 3.<br>Shakespeare, *March's Method*, 2. | History, 3.<br>Latin, 2. | Geology, 2.<br>Astronomy, 3. |

*Senior Year.*

| | | | |
|---|---|---|---|
| First Term. | Ethics, *Bascom.* | History, 2.<br>English Literature. 3. | Constitutional History, 2. |
| Second Term. | Logic, *Jevons.*<br>Political Economy. | History, 2.<br>English Literature. 3. | Elective course in Science for the year. |
| Third Term. | Metaphysic.<br>Political Economy. | History, 2.<br>English Literature. 3. | |

FOR THE DEGREE OF BACHELOR OF SCIENCE.

*Freshman Year.*

| | | | |
|---|---|---|---|
| First Term. | Analytical Geometry. | French, *Duffet.* | Chemistry, *Norton.* |
| Second Term. | Differential Calculus. | French, *Masson's Classics* | Chemistry, *Norton.* |
| Third Term. | Integral Calculus. | French, *Masson's Classics* | Chemistry, 2. *Lectures.* Mineralogy, 3. *Dana.* |

Free-hand Drawing two hours each week throughout the year.

*Sophomore Year.*

| | | | |
|---|---|---|---|
| First Term. | Elective course in Botany, Chemistry, or Physics for the year. English, *Day's Art of Discourse*, 2. and Study of words, *Trench*, 2. | French, *Moliere*, 2. Physics, *Ganot*, 3. | Botany, *Lectures*, 2. Zoology, *Packard*, 3. |
| Second Term. | | French, *Corneille*, 2. Physics, *Ganot*, 3. | Botany, *Lectures*, 2. Zoology, *Packard*, 3. |
| Third Term. | | French, *Racine*, 2. Physics, *Ganot*, 3. | Botany, *Lectures*, 2. Zoology, *Packard*, 3. |

*Junior Year.*

| | | | |
|---|---|---|---|
| First Term. | Elective course in Botany. Chemistry, or Physics for the year. | Elective course from list of sciences already given, with addition of Anatomy and Physiology. | Geology, *LeConte*, 5. |
| Second Term. | | | Geology, *LeConte*, 3. Astronomy, *Loomis*, 2. |
| Third Term. | | | Geology, *LeConte*, 2. Astronomy, *Loomis*, 3. |

*Senior Year.*

| | | | |
|---|---|---|---|
| First Term. | Elective course from Science or from Ethics. Logic and Political Economy. | Elective course from list of sciences given above, with the addition of Geology. | Psychology, *Porter*, 3. Constitut'l History, 2. |
| Second Term. | | | Psychology, *Porter*, 3. Constitut'l History, 2. |
| Third Term. | | | History of Philos'phy, *Schwegler*, 3. Constitut'l History, 2. |

It will be observed that at the beginning of the Sophomore Year of the Bachelor of Science course an advanced course in science is to be selected from such branches as have been already studied in their elementary forms in either the Freshman Year or in the Preparatory Course. The choice at this time is therefore confined to the three following, viz.: Botany, Chemistry and Physics.

At the beginning of the Junior Year the list of electives is extended by the addition of Vertebrate Anatomy and Physiology, and at the beginning of the Senior Year by the addition of Paleontology, and also Philosophy and Ethics.

In the Senior Year of the courses for the degrees of Bachelor of Arts and Bachelor of Philosophy, there is also an election to be made by the student. In the former, he can choose from any of the sciences, the elements of which have been previously given, and also from History: in the latter, his election is confined to the sciences.

Rhetorical exercises are required of stndents in all the above-named courses throughout the Sophomore, Junior and Senior Years.

## (B.) TECHNICAL COURSES.

The courses for the special degrees of Civil Engineer, Mining Engineer, and Mechanical Engineer, agree with the course for the degree of Bachelor of Science for the Freshman Year. They also have several studies in common with all the courses already named, as will be seen by the schedules. The course for the degree of Bachelor of Agriculture differs to a considerable extent from the courses previously described.

FOR THE DEGREE OF CIVIL ENGINEER.

*Sophomore Year.*

| | | | |
|---|---|---|---|
| First Term. | Surveying. | French, *Moliere*, 2.<br>Physics, *Ganot*, 3. | Analytical Chemistry. |
| Second Term. | Descriptive Geometry. | French, *Corneille*, 2.<br>Physics, *Ganot*, 3. | Analytical Chemistry. |
| Third Term. | Calculus. | French, *Racine*, 2.<br>Physics, *Ganot*, 3. | Analytical Chemistry. |

*Junior Year.*

| | | | |
|---|---|---|---|
| First Term. | Analytical Mechanics. | Geology. | Analytical Chemistry. |
| Second Term. | Roads. | Geology. | Analytical Chemistry. |
| Third Term. | Astronomy. | Geology (Economic). | Analytical Chemistry. |

*Senior Year.*

| | | | |
|---|---|---|---|
| First Term. | Mahan's Civil Engineering. | Physics. | Strength of Materials. |
| Second Term. | Drawing—Shadows and Perspective. | Physics. | Assaying. |
| Third Term. | Geodesy. | Physics. | Plans, etc. |

FOR THE DEGREE OF MINING ENGINEERING.

*Sophomore Year.*

| | | | |
|---|---|---|---|
| First Term. | Projection Drawing. | Surveying. | Analytical Chemistry. |
| Second Term. | Descriptive Geometry. | Mahan's Civil Engineering. | Analytical Chemistry. |
| Third Term. | Special Drawing. | Calculus. | Analytical Chemistry. |

*Junior Year.*

| | | | |
|---|---|---|---|
| First Term. | Geology. | Metallurgy. | Analytical Chemistry. |
| Second Term. | Geology. | Metallurgy. | Analytical Chemistry. |
| Third Term. | Geology (Economic). | Metallurgy. | Analytical Chemistry. |

*Senior Year.*

| | | | |
|---|---|---|---|
| First Term. | Assaying. | Analytical Mechanics. | Strength of Materials. |
| Second Term. | Mining Engineering. | Plans, Specifications, and Estimates for Metallurgical Works. | Blow-pipe Analysis. |
| Third Term. | Coal Washing and Mechanical Treatment of Ores. | Plans, Specifications, etc. | Determinative Mineralogy. |

FOR THE DEGREE OF MECHANICAL ENGINEER.

*Sophomore Year.*

| | | | |
|---|---|---|---|
| First Term. | Projection Drawing. | French, 2<br>Physics, *Ganot*, 3. | Mechanical Laboratory. |
| Second Term. | Descriptive Geometry. | French, 2.<br>Physics, *Ganot*, 3. | Mechanical Laboratory. |
| Third Term. | Calculus. | French, 2.<br>Physics, *Ganot*, 3. | Mechanical Laboratory. |

*Junior Year.*

| | | | |
|---|---|---|---|
| First Term. | Geology. | Physics. | Analytical Mechanics. |
| Second Term. | Geology. | Metallurgy. | Mechanism. |
| Third Term. | Astronomy. | Physics. | Mechanism. |

*Senior Year.*

| | | | |
|---|---|---|---|
| First Term. | Thermo-Dynamics.<br>Pneumatics. | Physics. | Strength of Materials.<br>Hydraulics. |
| Second Term. | Prime-Movers. | Physics. | Technical Drawing. |
| Third Term. | Mill-work. | Physics. | Machine Designing and Drawing. |

FOR THE DEGREE OF BACHELOR OF AGRICULTURE.

*Freshman Year.*

| | | | |
|---|---|---|---|
| First Term. | Surveying. | Mechanical Laboratory. | Chemistry. |
| Second Term. | Civil Engineering. | Mechanical Laboratory. | Chemistry. |
| Third Term. | Civil Engineering. (Roads, Drains, etc.) | Mechanical Laboratory. | Chemistry, 2–5. Mineralogy, 3–5. |

*Sophomore Year.*

| | | | |
|---|---|---|---|
| First Term. | Economic Botany. | Zoology, 3. Cryp. Botany, 2. | Agricultural Chemistry. |
| Second Term. | Physiological Botany. | Zoology, 3. Cryp. Botany, 2. | Agricultural Chemistry. |
| Third Term. | Special Botany. Grasses, etc. | Zoology, 3. Cryp. Botany, 2. | Agricultural Chemistry. |

*Junior Year.*

| | | | |
|---|---|---|---|
| First Term. | Horticulture. (General Principles.) (Fruit Culture.) | Geology. | Anatomy and Physiology. |
| Second Term. | Horticulture. (Vegetable Garden'g and Seed Growing.) (Arboriculture and Practical Forestry.) | Geology. | Anatomy and Physiology. |
| Third Term. | Horticulture. (Landscape Gardening.) (Practical Floriculture.) | Geology (Economic) | Anatomy and Physiology. |

*Senior Year.*

| | | | |
|---|---|---|---|
| First Term. | Soils, Manures, etc. | Domestic Animals—Varieties, etc. | Diseases of Animals. |
| Second Term. | Farm Crops and Tillage. | Breeding and Feeding Stock. | Principles of Treatment. |
| Third Term. | Farm Improvement and Management. | Dairying. Wool Growing, etc. | Particular Diseases. |

The range of instruction in the several subjects named above is more particularly defined in the following statements of the work provided in the different departments of the University:

## DEPARTMENTS AND RANGE OF INSTRUCTION.

### MATHEMATICS.

The preparatory department includes Algebra, Geometry and Plane Trigonometry. In the Freshman Year the subjects of Analytical Geometry, Differential Calculus, and Integral Calculus are taken up, and an additional term is subsequently given to the applications of Calculus in the Engineering courses.

### CIVIL ENGINEERING.

The order of studies in this department can be learned from the schedule which exhibits the course required for the degree of civil engineer.

*Text-Books.*—The works of Loomis on Algebra, Geometry and Astronomy. In parts of the course, works by Davies, Warren, Church, Gillespie, Mahan, Haupt, Worthen, and others.

In addition to the use and study of the text-books, the students are taught and practiced in the use of various astronomical and engineering instruments—the level, the transit, the plane-table, the sextant, the globes. They have practical field-work throughout the year, excepting only when the inclemency of the weather does not admit of it. The work consists in taking differences of level, running lines, measuring horizontal and vertical angles, determining the variation of the magnetic needle, finding the latitude of the pole star and by meridian altitudes of the sun; in fine, every variety of appropriate work which can be executed, is regularly, systematically, and thoroughly done.

### PHYSICS.

The instruction in Physics comprises three grades of work.

In the Preparatory Course, the elements or general principles of Pysics is taught during the second and third terms. The work consists, in the main, of a daily recitation, for which lectures by the instructor are occasionally substituted. This course is strictly elementary in its character, and is fully illustrated by experiments throughout.

During the sophomore year all regular students, except candidates for the degrees of Bachelor of Arts, Bachelor of Agriculture and Mining Engineer, have a recitation in Physics on three days of each week. In this course a text-book is used, and the work consists of recitations and lectures combined. Application is here made of the student's knowledge of mathematics to the more advanced portions of Physics. The formulae representing the more important physical laws are developed, and experiment is made use of whenever necessary to the elucidation of the subject.

In addition to the above, students in Civil or Mechanical Engineering are required to give the equivalent of one daily recitation throughout one year to Higher Physics. Candidates for the degree of Bachelor of Philosophy may elect the same for one year, and candidates for the degree of Bachelor of Science for one, two or three years. The work in this course consists largely of laboratory practice. Lectures are given regularly to the whole class upon subjects of general interest, such as Making and Reducing Observations and their discussion, including the method of Last Squares. Text-books are used and lectures given upon special subjects of study. The attempt is made to make all students familiar with methods of original research, and as far as possible every student is required to do something in the way of original investigation. Before beginning this grade of work students should have completed the course in Pure Mathematics.

FIRST YEAR.

First Term—Graphics and Mathematics applied, four-fifths; Experiments, one fifth.

Second Term—Physical Laboratory: Acoustics and Optics.

Third Term—Physical Laboratory: Heat.

SECOND YEAR.

First Term—Physical Laboratory: Heat.

Second Term—Physical Laboratory: Heat and Electricity.

Third Term—Physical Laboratory: Electricity and Magnetism.

In the five terms last named, the student uses the instruments of the laboratory in reviewing the work of others; or in original research. There are also combined with this, lectures on proper manipulation and care in keeping notes as conducive to trustworthy results; also, the theory of errors as regards instruments, reduction of observations, etc. The student is enabled to pursue his experiments thoroughly and extensively by means of the apparatus of the department, which includes many rare and valuable instruments.

*Works of Reference, accessible to the Student.*—Atkinson's Ganot's Physics, Deschanel's Physics, Kohlrausch's Physical Measurements, Pickering's Physical Manipulations, Stewart's Heat, Jamin's Physique, Clark and Sabine's Electrical Tables and Formulæ, Higg's Electric Lightning, Schwendler's Electric Testing.

## MECHANICAL ENGINEERING.

This course is intended for those who desire to prepare themselves either for the profession of Mechanical Engineering, for superintending the construction of machinery, or for managing machinery in manufacturing establishments. In it instruction in Principles is combined with practice. The former is mostly given by lectures, while the latter is confined to the Mechanical Laboratory.

The course includes the following special studies, all of which must be passed before taking the degree:

MECHANISM AND DRAWING—ONE YEAR.

Principles of Mechanism.
Machine Designing and Drawing.
Machine Drawing.

PRIME MOVERS AND MACHINERY—ONE YEAR.

Thermodynamics and Transmission of Fluids.
Prime movers.
Machinery and Mill-work.

Besides the above there will be required, for graduating:

Three terms of Elementary Laboratory Practice.
One term of Machine Construction in Laboratory.
One term of Strength of Materials and Hydraulics.

EXPLANATION OF THE COURSE.

In the Principles of Mechanism are studied the parts of machinery by pairs; or, elementary combinations of mechanism. In this the form and arrangement of the parts necessary for securing the desired modification of motion is sought.

In the Machine Designing the student takes up some problem in the shape of a particular machine for a special purpose. The forms, dimensions and arrangements of the parts are decided upon, and then a drawing is carefully made of the whole. Detail drawings to regulation size are then made, and finished in shade lines, as done in the best shops. The quality of these drawings is sufficient for the requirements of photo-engraving for illustrations upon circulars.

In Thermodynamics are studied the principles which form the groundwork of all heat engines.

In Prime Movers are studied all kinds of heat engines, such as steam, hot-air, etc., and also wind and water-wheels.

Mill-work and machinery takes up valve-gears, fly-wheels, governors, efficiency of parts of machines, strength of parts, etc.

The Mechanical Laboratory is intended for acquainting the student with the materials used in machine construction; with the forms customary in machinery; to impart a degree of skill in the use of tools, and a knowledge of the operations and practices of shops. The student uses most of the ordinary tools of the machine-shop, such as the vise, hand-lathe, drilling-machine, engine-lathe, milling and shaping-machine and planer; also, the forge and anvil, the iron cupola and brass furnace and pattern-makers' tools.

The first term consists of the actual use of tools in executing a set of forms chosen, with a view to supplying the greatest possible amount of practical instruction for the time. This is combined with weekly lectures on tools and their use.

The second term carries the above practice to the fitting together of parts. This is combined with weekly exercises in designing and drawing of machine elements, such as cranks, bearing-boxes, stub-ends, etc.

The third term is fully occupied in fitting parts carefully together, as in the joints of machinery, and in finishing the surfaces by scraping, polishing, burnish-

ing, etc. This is in combination with a weekly exercise in the invention of simple machines for specific operations, such as bending wire staples, cutting wooden combs, etc.

The fourth term of Mechanical Laboratory practice is constructive. It is taken in connection with the principles of mechanism. In the latter, problems in mechanism are worked out, forms and dimensions assigned to the parts, and then these are executed in the Laboratory, resulting in models of mechanical movements for the cabinet.

Projects will be assigned to the student, from time to time, on topics connected with his studies, requiring him to take indicator cards, test the efficiency of boilers, visiting manufacturing establishments, etc., and report. Such reports should be neatly made out on the regulation papers of the Department. These will be taken, in part, for the examinations, and retained for the cabinet.

*Text-Books and Works of Reference.*—Rankin's Steam Engine, and Machinery and Millwork; Weisbach's Mechanics; Willis's Principles of Mechanism; Belanger's Cinematique; Zeuner's Traité de la Chaleur; Neville's Hydraulics; Clausius and McCulloch on Heat; Sellers' Manual of Machine Tools; Shelley's Workshop; Unwin's Elements of Machine Design; Nicholson on Files and Filing.

### DEPARTMENT OF DRAWING AND DESIGN.

In Mechanical Drawing instruction is given in Elementary Projection Drawing, and to any special student who may desire it, advanced Mechanical Drawing, such as Architectural or other Constructive Drawing.

In Free-Hand Drawing, instruction is given in Elementary Drawing, Outline Drawing from the flat copy and from models, and Shading from models and casts; Water-color Painting from copies, and groups of objects; Oil Painting from the copy, and groups in still-life; Crayon Portraits from copy or photograph, and Modeling in clay.

## CHEMISTRY.

All students who wish to obtain a degree are required to study Chemistry for two and two-fifths terms. During this time General Chemistry, together with its most important applications to the arts, is taught by the use of text-books and of lectures, illustrated, by an ever-growing collection of the materials used in manufactures, and by a very complete suite of experiments.

After the completion of this elementary course, those who desire to devote special attention to Chemistry enter the analytical laboratory, where they can carry on their work for two years or more. This laboratory work is *required* only of students in Civil Engineering and in Mining. Any other student may enter the laboratory if his time and his strength permit.

The course in Analytical Chemistry provides full instruction in all departments of the science. In connection with the ordinary work of Qualitative Chemistry, the student is taught the use of the spectroscope, and of the blow-pipe in Determinative Mineralogy. He is also employed in making various compounds, and, if his time permits, studies exhaustively one or more of the elements and its important compounds.

The course of Quantitative Chemistry includes both the gravimetric and volumetric methods. The analyses are at first confined to those compounds whose structure is known, and afterwards extended to such bodies as the student may require in the special branch of the science to which he desires to devote himself. Opportunity is offered for the study of coals, ores, minerals, fertilizers, soils, or of the useful and waste products in manufactures.

If the student desires, he will also be assisted in taking up in detail topics which relate to Agriculture, to Pharmacy, to Medicine, and to other sciences, or to arts in which the principles of chemistry are applied. A full course of assaying is given in the Mining Laboratory, which is open also to students of chemistry.

A summary of the course is given below.

## REQUIRED OF ALL CANDIDATES FOR GRADUATION.

### GENERAL CHEMISTRY—TWO AND TWO-FIFTHS TERMS.

Inorganic and Organic Chemistry, and the applications of Chemistry to the Arts.

## SPECIAL COURSE.

### FIRST YEAR.

First Term—Qualitative Analysis: Exercises in Blow-pipe and Flame Reactions, Reactions in the dry way, Reactions of Single Bases and Acids.

Second Term—Qualitative Analysis continued: Determination of Mixtures, Blow-pipe Mineralogy, Preparation of Compounds.

Third Term—Quantitative Analysis, Stoichiometry, Review of General Chemistry throughout the year.

### SECOND YEAR.

Quantitative Analysis: Special studies in Chemistry applied to Pharmacy, to Agriculture, to Manufactures, and to the Arts.

*Text-books.*—Norton's Chemistry, Fowne's Chemistry, Beilstein's Manual, Galloway's Qualitative Chemistry, Will's Analytical Chemistry, Classen's Quantitative Chemistry, Fresenius's Quantitative Chemistry, Caldwell's Agricultural Chemistry.

*Books of Reference.*—Watt's Dictionary of Chemistry, Handwœrterbuch der Chemie, Gmelin's Hand-Book of Chemistry, Wagner's Chemical Technology, Graham-Otto's Chemie, Rose's Analytischen Chemie, Hoppe-Seyler and Gorup-Besanez's Physiologischen Chemie, Elderhorst's Determinative Mineralogy.

## MINING AND METALLURGY.

The course in Mining Engineering secures to the student careful instruction, with ample allowance of time, in the three fundamental branches of the art—mining, preparation of the ore, and its metallurgical treatment. These courses will comprise lectures, the study of text-books, preparation of maps, drawings, and sections, and visits to existing works, with careful reports upon them, and practice in estimates and designs.

For Assaying, there is a full equipment of furnaces and ores for the dry assay, and the wet methods are taught in the chemical laboratory.

An ample collection of minerals is provided, comprising all species with which the mining engineer should be familiar, and to this the students have constant and familiar access.

Crystallography is taught by the aid of a complete collection of large wood models, made especially for the department, and containing every common form.

*Text-Books and Books of Reference*—Dana's Mineralogy, Egleston's Crystallographic Tables, Callon's Mining, Andre's Mining and Mining Machinery, Phillips' Metallurgy Egleston's Metallurgical Tables, Rittenger's Aufbereitung, Gætzschmann's Aufbereitung, Bodemann & Kerl's Assaying, Mitchell's Assaying, Von Cotta's Ore Deposits.

## GEOLOGY AND PALEONTOLOGY.

In the preparatory course one term is given to Physical Geography. In all of the college courses two terms of General Geology are required, and in two of the engineering courses a third term is added, in which the subject of Economic Geology is taken up. The former subject is provided for in the first and second terms of the Junior year, and the latter in the third term of the same year.

Le Conte's *Elements of Geology* is made the basis of the instruction in the general course; Economic Geology is taught by lectures.

Students desiring to pursue Geology further can elect it as one of their studies throughout the Senior year. In this year, particular attention will be given to the Geology and Paleontology of Ohio, for the illustration of which subjects the museum affords ample materials. These subjects will be taught by lectures, by practical work in the museum, and as far as possible by field practice.

*Text-Books and Works of Reference.*—Le Conte's Elements of Geology, Dana's Manual of Geology, Lyell's Principles of Geology, Nicholson's Manual of Paleontology, Geological Reports of Ohio and other States.

## AGRICULTURE AND VETERINARY SCIENCE.

There are three years of work provided for the student in the department of Agriculture. In the first year, Soils are made a subject of examination, their geological relations and origin are explained, their composition is shown, and how it is determined; the special adaptations of soils to particular crops and modes of culture is shown, and how to increase or restore exhausted fertility; the management of pastures and meadows; the character and value of the different grasses, clovers and other forage plants; the culture of field crops, such as corn, wheat, oats, barley, rye, potatoes, etc.; also the value and application of animal manures, marl, gypsum, wood-ashes, lime, superphosphate, guano, and city sewage.

The work named above occupies the first and second terms. During the remainder of the year the following subjects are treated: Work of the farm and improvements; Drainage, draining tools, and the manufacture of drain-tiles; Irrigation, its value and methods; Farm Roads, and how to make them; Fences, material, construction, and cost; Rural Architecture, applied to the erection of farm-houses, barns, stables, etc.; Farm Machinery.

The second year is mainly spent on the following topics: The natural history,

description and adaptation of the various domestic animals—horse-training, cattle feeding, dairy management, wool-growing, etc.

The work of the third year is spent on the general subject of Veterinary Science. The range of instruction can be learned from the topics named below: General principles, Causes, Symptoms, Elements of Disease; Classification of Diseases, Principles of Treatment, and Remedial Agents; Particular Diseases and Operations. These are carefully studied, and, so far as opportunity can be obtained, diseases are treated, and operations made, under the inspection of the class.

## DEPARTMENT OF BOTANY AND HORTICULTURE.

The instruction in Botany begins with the first year of the Preparatory Course, one term of which is devoted to Structural and Systematic Botany. Further instruction is given in each of the following subjects: Economic Botany, Vegetable Physiology, Vegetable Histology, Gramineal Composition, and other special groups, Ferns and Fungi. Their arrangement, as regards the collegiate terms and years, is seen in the tabulated statement of the different courses of study.

The instruction is given by lectures in connection with Laboratory practice, supplemented by field-work or class excursions.

The practical bearings of the Science are made prominent in all the instruction given. In Fungi, special study is made of those forms producing rust, mildew, blight, etc., which prove so destructive to cultivated plants.

In Economic Botany, besides a study of the special characteristics, geographical distribution, and distinctive properties of all the prominent natural orders, the history, uses and importance of the different economic species, included in their orders, are fully considered.

The study of Horticulture comprises lectures and recitations in the class-room, supplemented by observations and practice in the gardens and orchards. It is treated as an art based on science. The instruction continues throughout the year. The first term is devoted to a study of the General Principles of Horticulture and Fruit culture. Under the first general subject the following are among the topics considered: Horticulture, as a profession, its relation to science; location for Horticultural work; implements, fertilizers, draining and irrigation, weeds and insects, management of help, marketing, etc.

The course in Fruit Culture embraces a study of the origin, history, methods of propagation, pruning and training, harvesting and marketing, insect enemies, diseases and varieties of both the small and large fruits.

In Arboriculture and Forestry, special attention is given to the influence of forests upon climate, the value of trees for timber and ornament, the best methods of culture, and a history of different varieties.

The instruction in Vegetable Culture includes kitchen and market gardening and seed-growing. Among the subjects considered are: location of the garden, laying out ground, draining, special preparation of soil, irrigation, management of composts, commercial fertilizers, implements, selection of seed, construction and management of green-houses, hot-beds, cold-frames; special garden crops, history, cultivation and varieties of each; growing seeds for home use and for market, the family kitchen garden, etc. In connection with the lectures, experiments, such

as testing the vitality and germinating power of different seeds, are conducted in the Laboratory.

The third term is devoted to Practical Floriculture and Landscape Gardening. The general subject is divided into the following topics: window-gardening, general management of house-plants, hanging-baskets, climbing vines, flowering bulbs, ferneries, Wardian cases, etc.; out-door flower-gardening, commercial flower-gardening, lawns, walks and drives, ornamental shrubs and trees. Flower-beds in the borders, and a considerable collection of ornamental shrubs and trees on the college grounds afford valuable means of illustration in the study of the above subjects.

## ZOÖLOGY AND COMPARATIVE ANATOMY.

The work of this department comprises the study of animal life, alike from the anatomical and the physiological aspect. Preparatory students receive, during the first term of their second year, instruction in this department in the elements of human anatomy and physiology. It is the object of this instruction to impart to these students such general knowledge of the structure and functions of their own bodies as will serve as a guide to their maintenance in a state of health and usefulness. Huxley's Lessons in Elementary Physiology is used as a text-book, accompanied by lectures and by anatomical and histological demonstrations.

All students who are candidates for bachelor's degrees receive instruction in Zoölogy during their Sophomore Year in this department. This instruction will be by lectures, with collateral reading, demonstrations, and such laboratory exercises as the size of the classes from year to year will permit, and will have for its object to impart to the student a clear conception of the animal kingdom as a whole rather than a mere technical familiarity with one of its lesser divisions, to illustrate the objects and methods of classification, to indicate the more important of those morphological relations on which all intelligent classification is based, and to give some insight into those principles which underlie all the phenomena of animal life. All the classes of the animal kingdom (as well as the orders of the more important classes) will receive consideration, but the larger proportion of the student's attention will be directed to the classes and order of the Invertebrata, partly because they include those forms least likely otherwise to come under their observation, and partly because of the larger amount of work done upon the Vertebrata in the advanced work of the department.

At the beginning of the Junior Year students who are candidates for the degree of Bachelor of Science have open to their election the advanced work of this department. The first year of this work is devoted mainly to the study of Physiology, with its necessary accompaniments of Histology and Physiological Anatomy, in the following manner:

The student begins the consideration of any function, or group of functions, by a careful dissection of the organs involved in one or more of the domestic animals. The dissecting-room is convenient and well-lighted, and is well supplied with the nesessary material and appliances. While the human body is never dissected here, students looking to the medical profession can here acquire a knowledge of practical anatomy and an amount of experience that will prove of great service in the future.

The Histology of the parts involved follows, then anatomy. The student is here

not only furnished with suitable preparations for study, but also taught to harden material, to cut, stain, and mount sections for himself, and to perform all the histological manipulations. The laboratory is supplied with microscopes, microtomes, etc., and with all necessary reagents, and offers special facilities in this direction.

The form, structure and relations of the organs involved having been duly examined, the student now proceeds to the dissection of the function in question. The Physiological Laboratory is provided with facilities for practical work in chemical physiology, such work being supplemented by reading and lectures. Provision having not yet been made for the practical study of the physics and mechanics of the body, instruction is given in these cases by reading and lectures only.

It is, of course, not practicable to discuss in this manner all the functions of the animal body in a single year. Such a selection will be made each year as will best illustrate the methods and progress of physiological research, and will, all things considered, be most profitable for the students then in the laboratory.

This year's work is open to all students (other than those indicated), who have completed the required Physics, Chemistry, Physiology and Zoölogy of the preparatory and college classes. It is required of Juniors in Agriculture.

The second year's work, open to all who have completed the work of the first year, deals with the phenomena of animal life from morphological rather than the physiological side. The organization, classification and distribution of animals, the principles of comparative anatomy, the phenomena of embryology and their significance will here receive attention.

While the work of this year will be arranged largely with reference to the requirements and aptitudes of each student, the following general plan will be followed. Each student will be required to study as thoroughly as the time and the facilities afforded by the department will permit, the Zoölogy of one of the lower divisions of the Invertebrata, the morphology of one or more classes from one of the higher divisions, and the comparative anatomy of at least one group of organs in the Vertebrata.

In addition to numerous works of reference accessible to students, the following hand-books are required to be provided: for the first year's work, Mivart's Lessons in Anatomy, Prudden's Practical Histology, and Sanderson's Syllabus of Lectures on Physiology (2d edition); Frey's Compendium of Histology and Foster's Text-book of Physiology are recommended in addition; for the second years' work, Gegenbaur's Comparative Anatomy, and Huxley's Anatomy of Invertebrates.

## HISTORY AND ENGLISH.

### HISTORY.

Elementary instruction in United States and General History is afforded in the aratory course. Three courses of Advanced History are provided for students degree of Bachelor of Philosophy. The third of these, a course in United States Constitutional History, is also required of candidates for the degrees of B.A. and B.Sc.

The arrangement of the work is as follows

PREPARATORY COURSE.

*First Year.*

Second Term—United States History (Eliot).
Third Term—General History (Freeman).

COLLEGE COURSE.

*Junior Year of Course for the Degree of Ph.B.*

The Middle Ages; text-book, Hallam. Lectures. Three hours per week for a half year.

Modern History to 1815 as seen in the Conflict of Liberty and Absolutism; text-book and lectures. Three hours per week for a half year.

*Senior Year of the same Course.*

History of the English Constitution; text-book and lectures. Two hours per week for a half year.

The History of the XIXth Century and present condition of the Great Powers; text-book and lectures. Two hours per week for a half year.

*Senior Year of the Courses for the Degrees of B.A., Ph.B., and B.Sc.*

United States Constitutional History and Civil Polity; by lectures and theses. Two hours per week throughout the year.

*Text-books and works of reference.*—The histories by Hallam, Sheppard, Sismondi, Gibbon, Martin, Von Sybel, Thiers, Alison, Motley, Dunham, Von Raumer, Von Ranke, Gervinus, Savigny, Bryce, Green, Freeman, Hume, Macaulay, Turner, Stubbs, May, Seeley, Arndt, Adams, Mackenzie, and Freeman's Historical Geography of Europe, etc., etc.

*Works of reference in Constitutional History of the United States.*—Curtis' History of the Constitution; Von Holst's Constitutional History of the United States; Frothingham's Rise of the Republic; the Federalist; the works of Adams, Hamilton, Jefferson, Madison, Webster, Elliot's Debates, Benton's Thirty years' View, The Annals of Congress, Benton's Abridgement of the Debates of Congress, etc.

ENGLISH.

The advanced work in English runs through two years in the courses for B.A. and B.Ph. The following progressive course is provided:

*Junior Year.*

First Term—Anglo-Saxon (March's Grammar and Reader).
Second Term—Chaucer (Clarendon Press edition of Prologue, Knight's Tale, etc.)
Third Term—Shakespeare (Julius Cæsar, and Macbeth).

*Senior Year.*

First Term—Hale's Longer English Poems.
Second Term—A History of English Literature.
Third Term—A History of English Literature (including American authors).

The class-room work in English occupies two hours per week in each of the years named. Lectures, historical and critical, on language and literature run parallel to the course prescribed.

*Books for Reference.*—Maetzner's Englische Grammatik; Earl: Philology of the English Tongue; Marsh: Lectures on Origin, and History of English Language; Lectures on English Language and Literature; Taine's and Craik's Histories of English Literature; Morris: English Accidence; Grein: Angelsächsische Bibliothek, etc., etc.

## GERMAN AND FRENCH.

A two years' course in each of the two languages is provided for. In either course the student attends mainly to grammatical doctrine and literal versions, at first, and to the literary contents and characteristics of what he reads as he progresses. Lectures upon the respective literatures run through the second year of the courses.

### GERMAN.

*First Year.*

First and Second Terms—Cook's Otto's German Grammar.
Third Term—Schiller's Der Neffe als Onkel—Composition.

*Second Year.*

First Term—Schiller's Maria Stuart; Composition.
Second Term—Lessing's Nathan der Weise; Literature.
Third Term—Goethe's Iphigenie; Literature.

### FRENCH.

*First Year.*

First Term—Duffet: French Grammar and Exercises.
Second Term—Grammar continued; Masson's French Classics, vol. 5.
Third Term—French Classics continued.

*Second Year.*

First Term—Molière: Le Misanthrope.
Second Term—Corneille: Cinna; Literature.
Third Term—Racine: Athalie; Composition.

## LATIN LANGUAGE.

The course of study in Latin extends through four years, and is arranged as follows:

### PREPARATORY LATIN.

*First Year.*

First Term—Leighton's Latin Lessons; Allen and Greenough's Latin Grammar.
Second Term—Lessons; Cæsar, *De Bellico Gallico*, Book II.
Third Term—Cæsar continued; Roman History.

*Second Year.*

First Term—Cicero, *In Catilinam.*
Second Term—Cicero continued; Virgil's *Æneid* begun.
Third Term—Virgil continued.

COLLEGE COURSE.

*Freshman Year.*

First Term—Livy, Books XXI. and XXII.
Second Term—Tacitus, *Germania* and *Agricola.*
Third Term—Horace, *Odes.*

*Sophomore Year.*

First Term—Horace, Juvenal.
Second Term—Tacitus; *Histories* or *Annals.*
Third Term—Plautus, *Trinummus*; Quintilian.

During the college course instruction will be given by text-books, or lectures in Roman Antiquities and History, in the Latin Language and Literature and in Roman Law. Frequent exercises are required in Latin prose composition.

The requirements in Latin for admission to college embrace three books of Cæsar, five orations of Cicero, four books of Virgil's Æneid, Latin Composition and a good knowledge of Latin Grammar.

## GREEK LANGUAGE.

The course in Greek comprises three years of college work, arranged as follows:

*Freshman Year.*

First Term—White's Greek Lessons; Goodwin's Grammar.
Second Term—Lessons; Xenophon's *Anabasis*, Book I.
Third Term—*Anabasis* continued.

*Sophomore Year.*

First Term—Xenophon's *Memorabilia;* Plato's *Phædon.*
Second Term—Herodotus, selections.
Third Term—Homer, *Iliad* or *Odyssey.*

*Junior Year.*

First Term—Greek Dramatists.
Second Term—Greek Dramatists.
Third Term—Greek Historians and Orators.

Greek Prose Composition and Greek History are studied during the Freshman and Sophomore years.

In the Sophomore and Junior Years instruction is given in Greek Antiquities and Literature.

## PHILOSOPHY AND POLITICAL ECONOMY.

The course in Philosophy extends through the Junior and Senior years. The Junior Year is devoted to Psychology and the History of Philosophy; the Senior year to Ethics, Logic, Metaphysics, and Political Economy. All these subjects are taught by text-books. The students work up the topics by examining their own minds, by searching the best authors, and by weekly essays and discussions which are required from each student.

## PROVISIONS FOR SPECIAL STUDENTS.

To students entering the University for the purpose of taking some special study, and who do not propose to complete a regular course, *full freedom in the selection of the branches which they will pursue is granted, subject only to the necessary limitation that they are prepared to take up with advantage the studies which they select.* They will enter the classes organized for the regular courses, and they can not be allowed to impair the quality of work done in the classes through their own inadequate preparation. Advanced students will find every facility for special work. The preliminary examinations are required of special students.

## PROVISION FOR INSTRUCTION IN AGRICULTURE.

The University recognizes its obligations, imposed in the terms of the grant on which it is founded, to the great industrial interest of agriculture. This obligation it aims to meet in various ways. It fixes its standard of admission so that students may enter its classes from the common schools. It provides for thorough instruction in the branches of science on which Agriculture depends. It has established a professorship of theoretical and applied Agriculture. It has established a professorship of Botany and Horticulture. It has laid down a special course leading to the degree of Bachelor of Agriculture. It has instituted courses of lectures in the sciences relating to Agriculture and in theoretical Agriculture, to which the farmers of the State are invited without charge.

While it is believed that the varied and complex questions with which the farmer has to deal, justify and require, for their most successful treatment, the extended and thorough courses of study necessary for the degree of Bachelor of Agriculture, it is still recognized that comparatively few will return from a six years' course of study to the farm again, and, therefore, all possible advantages are offered to young men from the country who enter the institution for a shorter time. The work of the department of Agriculture is shaped so as to give to this class as large a measure of service as possible for whatever time they are on college ground.

## LITERARY SOCIETIES.

There are two Literary Societies in the University, the *Alcyone* and the *Horton*. Both are provided with rooms in the University building, the equipment of the Alcyone hall having been mainly furnished through the generosity of the late John G. Deshler, of Columbus. The societies are vigorous and effective, and furnish to the student a very desirable training in public speaking and parliamentary order.

# ADMISSION.

## I. TO THE PREPARATORY DEPARTMENT.

For admission to the Preparatory Department of the University, students must pass a satisfactory examination in the branches taught in the common schools, viz.: Reading, Orthography, Writing, Grammar, Geography, Arithmetic, and Algebra through simple equations.

The attention of those proposing to enter the University is especially directed to the terms above given. A competent knowledge of the common school branches is required. The University does not undertake to do the work which the common schools are able and willing to do, viz.: that of grounding the student in the elements of an English education. He must bring with him a fair measure of the training which these schools are prepared to give. If it be asked what is a competent knowledge of these branches, it may be answered that the candidate should certainly have knowledge enough of them to entitle him to a teacher's certificate from a county board of examiners.

Graduates of the high schools of the State are admitted to the Preparatory Department without examination. Applicants having a teacher's certificate of twelve months, are also admitted without examination, except in Algebra, where this study is not included in the certificate.

## II. TO THE COLLEGE CLASSES.

For admission to the Freshman Class of any course, the student must sustain examination in the studies of the Preparatory Department, that lead to this course. The Preparatory Department, as now constituted, agrees very well with the course of instruction in the better grade of high schools of the State. The full requisitions, then, for admission to college standing, are as follows:

English Grammar,
Common School Geography,
Physical Geography,
Arithmetic,
Algebra,
Geometry,
Trigonometry,
Botany,
Physics,
Human Physiology,
United States History,
General History,
Latin or German, to the amount of a two-years' course.

Graduates of high schools of this State, in cities having a population of 5000 or more, by the census of 1870, and of such other high schools and academies of the State as give satisfactory evidence to the faculty of the efficiency of their courses of study, will, on presenting their diplomas, be admitted to the Freshman Class, in any course of study for which their previous high school work shall have fitted them.

Students who do not design to complete a regular course of instruction, are allowed to select such studies as they are prepared to carry on with profit to themselves and without detriment to the regular classes.

Students are admitted to advanced standing in any of the courses, on their sustaining examination in the work required in the University for such standing.

Students entering from other colleges are required to bring certificates of honorable dismission.

The University is open to students of both sexes, but there are no buildings provided for the residence of young ladies on the College grounds. Boarding-places, in respectable families, are secured for such young ladies as enter the institution, but the faculty is not so situated that it can exercise supervision over their conduct outside of College hours. Parents, who place their daughters in the University, should be well satisfied as to their discretion, or else should leave them under the care and control of the family with which they board.

## EXPENSES.

1. *College Dues.*—A charge of $5.00 a term, or $15.00 a year, is made against all students, under the head of incidental expenses. *There is no charge for tuition in any department of the University;* but advanced students in Chemistry and Physics are required to pay fees to cover, in part, the cost of materials consumed, and the deterioration of the expensive instruments employed. The fee in the Chemical Laboratory is $10.00 per term, and in the Physical Laboratory $7.00 per term. These dues are required at the opening of each term.

2. *Board.*—There are two dormitories on the College grounds, provided for the use of students. The smaller of these provides unfurnished rooms, *rent free*, to such students as desire to board themselves, and thus to reduce their expenses to a minimum. Twenty students can be accommodated in the building, two students being assigned to each room. The expense of living in this way falls below $2.00 per week.

The larger dormitory can accommodate seventy students. It is, for the present, turned over to the University club, *rent free*. Board, fur-

nished room, fuel, light, and washing are, at present prices, supplied for less than $3.50 per week. New students will not, however, be admitted to the club without special recommendation.

Boarding-clubs are, also, frequently organized in the neighborhood of the College, by students, in which expenses are kept at $3.50 per week, at present prices.

Board, with furnished rooms, can be obtained in private families within convenient distances of the College, at rates varying from $3.50 to $5.00 per week. The ruling rate may be taken as $4.00 per week for young men, and $4.50 for young ladies.

Free access to the College is secured by two lines of street railroads, which connect it with the central portions of the city.

There is a large amount of work on the College farm that can be performed to advantage by students, and for which they are paid at the current rates for such labor. A number of students defray all their college expenses by such labor. In the assigning of work, preference is given to students in the department of agriculture, and to those who are ready to devote a certain number of hours each day to the tasks required. *The University does not guarantee work to all applicants.*

A college uniform has been adopted, with which all members of the military organization are required to provide themselves. The cost of the uniform is about $25.00.

SUMMARY.

The expenses of a college year of thirty-eight weeks, will include the following items, viz.:

| | | | |
|---|---|---|---|
| College dues | $15 00 | | $15 00 |
| Board, rooms, etc., at $3.00 per week | 114 00 | at $4 50 | 171 00 |
| Total | $129 00 | | $186 00 |

This estimate provides for light, fuel and washing, but does not include text-books nor charges for laboratory supplies. Students boarding themselves can reduce the lowest of these estimates at least $30—making a total of $100.

## RULES AND REGULATIONS.

The following rules and regulations, among others, are now in force in the University:

STANDING.

1. The standing of students shall be reported at the end of each term as "passed with merit," "passed," "conditioned," or "failed";

such standing to be determined by examination, written, wherever possible.

2. The expression "conditioned" signifies "subject to re-examination at the middle of the following term."

3. The regular work of each laboratory is regarded as the equivalent of five class-room exercises per week. Two consecutive hours daily in the Art department is also so regarded.

4. No special or unclassified student is allowed to take less than fifteen or more than eighteen hours per week of class-room work, or its equivalent, and no student conditioned in any study will be permitted to take more than fifteen hours per week the following term.

5. At the close of each term students must pass in examinations in studies, representing at least ten hours per week, in order to retain their standing in college.

6. Students conditioned in studies, representing ten hours per week, must pass satisfactory examinations in at least one-half of those studies before regaining their standing in college.

7. Students failing in examinations, representing ten hours per week, forfeit their place in college thereby.

8. Students who fail in the term examinations, or in an examination for conditions, are required to take the study or studies in which they fail, on their occurrence, in the following year, except when excused by the faculty.

9. Students failing on a re-examination for a condition, are dropped from that class, if a continuous one.

10. Absence from any examination is construed as a failure therein.

11. Students in any three-term class who fail to attain the grade "passed" at the end of more than one term, shall be required to repeat the work of the whole year, unless excused by the professor in charge; and the students in any two-term class who are reported as "failed" at the end of the second term, may be required by the professor in charge to repeat both terms' work.

### TERM BILLS.

The payment of term bills is required of all students by the second Wednesday of each term, as the condition of remaining in college.

## CALENDAR.

The Winter term commences on Thursday, January 5, 1882, and continues 12 weeks, closing on Wednesday, March 29.

The Spring term commences on Thursday, April 6, and continues 11 weeks, closing on Wednesday, June 21, (Commencement Day).

The Fall term commences on Thursday, September 14, and continues 14 weeks, closing on Wednesday, December 20.

# CATALOGUE OF STUDENTS.

The following catalogue includes only the names of students in attendance, November 1, 1881. The whole number of students in attendance between Nov. 1st, 1880, and Nov. 1st, 1881, is 365:

The under graduate students of the University are arranged in the four following divisions, viz.:

(1.) Regular Students.
(2.) Special Students.
(3.) Preparatory Students.
(4.) Unclassified Students.

The first division includes the four college classes; the second includes students who have attained college rank by completing the preparatory course or its equivalent, but are now pursuing selected studies; the third division includes the students that are pursuing the regular preparatory course; while the fourth includes all other students.

Degrees in course were conferred at the last commencement, June 21, 1881, as follows:

The degree of Master of Science upon Curtis C. Howard, B.Sc. M.D.
The degree of Mining Engineer upon Ferdinand Howald, B.A.

## CLASS OF 1881.

Josephine M. Bates, B.Ph.
William K. Cherryholmes, B.Sc.
Charles M. Lewis, B.A.
David O'Brien, B.Sc.
Harwood S. Pool, B.Ph.
Kenneth D. Wood, B.A.

## CERTIFICATES OF PROFICIENCY.

William E. Hawley.
John C. McCullough. } In Civil Engineering.
Jacob D. Streeper.

## RESIDENT GRADUATES.

William K. Cherryholmes, B.Sc.
David O'Brien, B.Sc.

## REGULAR STUDENTS.

| Name. | Residence. | County. |
|---|---|---|
| **SENIOR CLASS.** | | |
| Davis, Floyd | Ithaca, N. Y | |
| Donham, William W | Lindale | Clermont. |
| Fassig, Oliver L | Columbus | Franklin. |
| Fay, F. Willis | Columbus | Franklin. |
| Glover, Sioux | Hilliard | Franklin. |
| Keffer, Frederic | Cleveland | Cuyahoga. |
| Linson, Irvin | Yellow Springs | Greene. |
| Wilgus, Horace L | Conover | Miami. |
| Warner, Cora | Chillicothe | Ross. |
| **JUNIOR CLASS.** | | |
| Ackerman, Fremont | Columbus | Franklin. |
| Bradford, Joseph N | Columbus | Franklin. |
| Brotherton, William | Cedarville | Greene. |
| Dun, George W | Dublin | Franklin. |
| Dun, John G | Dublin | Franklin. |
| Galbraith, John H | Columbus | Franklin. |
| Higbee, Charles E | Cleveland | Cuyahoga. |
| Keyser, Isaac N | Columbiana | Columbiana. |
| Knopf, George | Columbus | Franklin. |
| Lovejoy, Jesse R | Columbus | Franklin. |
| Marvin, C. Frederic | Columbus | Franklin. |
| McDowell, John A | Columbus | Franklin. |
| Miller, Charles C | Baltimore | Fairfield. |
| Swickard, Belle | Columbus | Franklin. |
| VanHarlingen, E. M | Columbus | Franklin. |
| Vanderburg, Charles R | Columbus | Franklin. |
| Wilson, Stonewall J | Clarksburg, W. Va | |
| **SOPHOMORE CLASS.** | | |
| Ackerman, Eli O | Columbus | Franklin. |
| Allen, Horace | Troy | Miami. |
| Anderson, James T | Columbus | Franklin. |
| Chamberlain, Helena W | Yellow Springs | Greene. |
| Gaskill, David L | Greenville | Darke. |
| Green, Clarence C | Middleport | Meigs. |
| Hine, Lucius A | Milan | Erie. |
| Malone, William R | Conneaut | Ashtabula. |
| Mix, Melvin N | Avenue | Franklin. |
| Orton, Edward, Jr | Columbus | Franklin. |
| Sabine, Annie W | Richwood | Union. |
| Wikoff, John B | Columbus | Franklin. |

REGULAR STUDENTS—Continued.

| Name. | Residence. | County. |
|---|---|---|
| **Freshman Class.** | | |
| Benedict, Edward | Dayton | Montgomery. |
| Eisenlohr, Berthold A. | Dallas, Texas | |
| Erskine, John G. | Lowellville | Mahoning. |
| Harrison, William H. | Columbus | Franklin. |
| Liggett, William K. | Marysville | Union. |
| Lindenberg, Louis B. | Columbus | Franklin. |
| Mackey, Denver | Sandusky | Erie. |
| Marple, Charles A. | Columbus | Franklin. |
| Marquardt, Jesse C. | Tiffin | Seneca. |
| McNair, Anna | Yellow Springs | Greene. |
| Miller, C. William | Columbus | Franklin. |
| Milligan, J. Porter | Rushville | Fairfield. |
| Paine, Elmer E. | Xenia | Greene. |
| Peters, William L. | Columbus | Franklin. |
| Pleukharp, Charles V. | Columbus | Franklin. |
| Pomerene, William R. | Coshocton | Coshocton. |
| Terry, Harry K. | Columbus | Franklin. |
| Twiss, George R. | Columbus | Franklin. |
| Wall, Frank T | Marysville | Union. |
| Williams, Paul S. | Scioto Furnace | Scioto. |

SPECIAL STUDENTS.

| Name. | Residence. | County. |
|---|---|---|
| Bird, Minnie E. | Zanesville | Muskingum. |
| Casey, J. Sheafe | Evansville, Ind | |
| Downerd, Edward C. | Zanesville | Muskingum. |
| Fitch, Eliza D. | Columbus | Franklin. |
| Heinlein, Andrew J. | Bridgeport | Belmont. |
| Hughes, Frank W. | Columbus | Franklin. |
| Miller, Walter M. | Portsmouth | Scioto. |
| Moore, Alvin A. | Kenton | Hardin. |
| Smith, Philo C | Canton | Stark. |
| Smith, Sarah A. | Canton | Stark. |
| Sparks, Ed. E. | London | Madison. |
| Streeper, Jacob D. | Chillicothe | Ross. |
| Streeper, Alice B. | Chillicothe | Ross. |
| Sweeney, Thomas D. | Covington | Miami. |
| Tallmadge, Theodore | Columbus | Franklin. |
| Ward, J. Homer | Sandusky | Erie. |

## PREPARATORY STUDENTS.

| Name. | Residence. | County. |
|---|---|---|
| **SECOND YEAR.** | | |
| Allcott, Frank L | Columbus | Franklin. |
| Armstrong, Philip D | Tippecanoe City | Miami. |
| Beatty, George W | Columbus | Franklin. |
| Carroll, Clara | St. Clairsville | Belmont. |
| Clark, James S | Deersville | Harrison. |
| Comly, Guy S | Columbus | Franklin. |
| Converse, Edward J | Columbus | Franklin. |
| Cunningham, George S | Lancaster | Fairfield. |
| DeFord, Alonzo F | Carrollton | Carroll. |
| Devol, Laura | Marietta | Washington. |
| Dowsett, Edward | Honolulu, Sandwich Islands | |
| Dozer, Martin T | Deavertown | Morgan. |
| Frazee, William D | Pyrmont | Montgomery. |
| Gilbert, Newton W | Angola, Ind | |
| Heilman, William T | Campbellstown | Preble. |
| Hill, Frank E | Neville | Clermont. |
| Houston, Fred | Marysville | Union. |
| Howard, Horton | Alton | Franklin. |
| Jeffries, May A | Mifflinville | Franklin. |
| McKinney, William H | Morrow | Warren. |
| Merion, James E | Columbus | Franklin. |
| Oxer, Orange E | Campbellstown | Preble. |
| Pfaff, Carl P | Columbus | Franklin. |
| Pixley, Frank S | West Richfield | Summit. |
| Sabine, Wallace C | Richwood | Union. |
| Schroll, Otto | Columbus | Franklin. |
| Scott, Anna N | Columbus | Franklin. |
| Scott, May Mermod | Columbus | Franklin. |
| Scott, Winfield | Columbus | Franklin. |
| Sexton, Maggie | Columbus | Franklin. |
| Sheperd, Jacob L | Osborne | Greene. |
| Shoemaker, William | Tarlton | Pickaway. |
| Stockwell, Harry L | Columbus | Franklin. |
| Thompson, Howard N | Columbus | Franklin. |
| Watt, Sern P | Jamestown, Neb | |
| **FIRST YEAR.** | | |
| Adel, E. E | Groveport | Franklin. |
| Ballou, Harry A | Columbus | Franklin. |
| Bixler, William I | Pyrmont | Montgomery. |
| Blankner, Fred., Jr | Columbus | Franklin. |
| Bromley, Robert A | Columbus | Franklin. |
| Carlin, Wm. E | Columbus | Franklin. |
| Cathcart, Josie | Columbus | Franklin. |
| Chapman, Harry S | Utica | Licking. |
| Colvin, Darwin H | Pittsburgh, Pa | |
| Converse, H. Penn | Columbus | Franklin. |
| Cook, Cora | Harlem | Delaware. |
| Cook, Daniel R | Parkersburg, W. Va | |
| Cornfield, Charles | Columbus | Franklin. |
| Cupp, Frank | Columbus | Franklin. |
| Doney, A. L | Fairmount, Ill | |
| Dougherty, Ida | Columbus | Franklin. |

PREPARATORY STUDENTS—Continued.

| Name. | Residence. | County. |
|---|---|---|
| FIRST YEAR—Continued. | | |
| Erskine, James H | Lowellvilie | Mahoning. |
| Fawcett, Joseph M | Carrollton | Carroll. |
| Fawcett, Wm. C | Kilgore | Carroll. |
| Fickell, Isaac H | Hilliard | Franklin. |
| Firestone, Joseph F | Canton | Stark. |
| Fritchy, Frank L | Columbus | Franklin. |
| Gordon, John L | Worthington | Franklin. |
| Haig, James | Columbus | Franklin. |
| Hamilton, Thomas B | Columbus | Franklin. |
| Harmon, Maud | Columbus | Franklin. |
| Herd, Joseph E | Clintonville | Franklin. |
| Hodder, Thomas H | Columbus | Franklin. |
| Holton, Edward E | Columbus | Franklin. |
| Hoover, Ellis A | West Milton | Miami. |
| Hunter, William C | Columbus | Franklin. |
| Keifer, William W | Springfield | Clarke. |
| LaDow, Jesse E | Plymouth | Richland. |
| Lane, Charles L | Point Isabel | Clermont. |
| Laughlin, Charles C | Love City | Guernsey. |
| Licey, John O | River Styx | Medina. |
| Lilley, Walter T | Columbus | Franklin. |
| Longsdorf, William O | Columbus | Franklin. |
| Lowman, Ellsworth M | West Alexandria | Preble. |
| Madden, Harry P | Mutual | Champaign. |
| Martin, Cyrus B | Columbus | Franklin. |
| Martin, Franz S | Bloomville | Seneca. |
| Martin, Frank W | Bloomville | Seneca. |
| McKee, Caleb L | Columbus | Franklin. |
| Miller, Frank | Crestline | Crawford. |
| Minton, Henry M | Bowling Green | Wood. |
| Morrison, Clarence | Columbus | Franklin. |
| Mullay, Annie F | Columbus | Franklin. |
| Myers, Joseph | Columbus | Franklin. |
| Myers, Uriah H | Columbus | Franklin. |
| Nauman, William H | Dayton | Montgomery. |
| Neil, Flora | Columbus | Franklin. |
| O'Harra, Arthur | Columbus | Franklin. |
| Osborn, William F | North Jackson | Mahoning. |
| Oviatt, Truman D | West Richfield | Summit. |
| Peasley, Hattie A | Flint | Delaware. |
| Pegg, Elmer | Clintonville | Franklin. |
| Rippey, Thresher A | Columbus | Franklin. |
| Scheibell, William O | Columbus | Franklin. |
| Sharp, John C | Cadiz | Harrison. |
| Shattuck, Fred | Columbus | Franklin. |
| Smith, Charles P | Clintonville | Franklin. |
| Smith, Hattie L | Columbus | Franklin. |
| Springer, Lorin C | Shanes Crossings | Mercer. |
| Tiffany, Ettie | Lewis Centre | Delaware. |
| Welsh, Emmet A | Deersville | Harrison. |
| Welsh, Pinkney M | Deersville | Harrison. |
| Woods, Horace A | Chilo | Clermont. |

## UNCLASSIFIED STUDENTS.

| Name. | Residence. | County. |
|---|---|---|
| Albaugh, Clarence M | Covington | Miami. |
| Allen, Charles | Washington C. H | Fayette. |
| Allen, Frank M | Washington C. H | Fayette. |
| Amy, Charles S | Payne's Corners | Trumbull. |
| Applegate, Charles R | Beverly | Washington. |
| Ashinger, Frank C | Upshur | Preble. |
| Ballard, James O | Tarlton | Pickaway. |
| Beach, Charles M | Kelloggsville | Ashtabula. |
| Bell, Lillian | Columbus | Franklin. |
| Boggs, Edward | Chattanooga, Tenn | |
| Braun, Charles L | Columbus | Franklin. |
| Brundage, F. E | Melmore | Seneca. |
| Calderhead, James A | Limaville | Stark. |
| Clime, Willard B | Avenue | Franklin. |
| Conaway, John W | Arcadia | Hancock. |
| Cooley, Arthur S | Dover Centre | Cuyahoga. |
| Cook, Luella Z | Clintonville | Franklin. |
| Cook, Russell P | Chillicothe | Ross. |
| Courtright, Theodore E | Lithopolis | Fairfield. |
| Cramblet, Thomas E | Deersville | Harrison. |
| Cranz, Lewis C | Everett | Summit. |
| Crumley, Clarence M | Lancaster | Fairfield. |
| Davis, Charles A | Columbus | Franklin. |
| Denver, James W | Wilmington | Clinton. |
| Devol, Selden S | Marietta | Washington. |
| Devol, William S | Marietta | Washington. |
| Dickey, Marcus C | Central College | Franklin. |
| Dunbar, Ernest A | Ashtabula | Ashtabula. |
| Dun, Davis | Dublin | Franklin. |
| Duncan, Jennie | Columbus | Franklin. |
| Eastman, J. Coates | West Alexandria | Preble. |
| Esterley, Charles E | Columbiana | Columbiana. |
| Floyd, Stephen E | Wintersville | Jefferson. |
| Glover, Libbie | Hilliard | Franklin. |
| Green, William J | Granger | Medina. |
| Hahn, Irvin A | North Lima | Mahoning. |
| Hanson, George | Bradford, England | |
| Haseltine, Edward D | Haselton | Mahoning. |
| Haskins, C. N | Columbus | Franklin. |
| Heinlein, Andrew J | Bridgeport | Belmont. |
| Heinlein, Charles | Bridgeport | Belmont. |
| Hirst, Charles | Columbus | Franklin. |
| House, William D | Columbus | Franklin. |
| Howells, E. Stanton | Massillon | Stark. |
| Hull, Alice | Columbus | Franklin. |
| Huston, Robert T | West Alexandria | Preble. |
| Jackson, John | Vevay, Ind | |
| Keifer, J. Warren, Jr | Springfield | Clarke. |
| Kelsey, Milton | Hebron | Licking. |
| Kenney, Melvin P | Isle St. George | Ottawa. |
| Kiger, William L | Lancaster | Fairfield. |
| Kinnear, Edward F | Columbus | Franklin. |
| Kridler, William H | Columbiana | Columbiana. |
| Lehner, Emma | Mifflinville | Franklin. |
| Lewis, John T | Ashtabula | Ashtabula. |
| Lovejoy, Ellis | Columbus | Franklin. |
| McClain, John A | West Lafayette | Coshocton. |
| Mead, Clint. V | Jefferson | Ashtabula. |
| Miller, Samuel | Canton | Stark. |

UNCLASSIFIED STUDENTS—Continued.

| Name. | Residence. | County. |
|---|---|---|
| Mills, Stephen A | Washington C. H | Fayette. |
| Mills, John W | West Alexandria | Preble. |
| Mills, Wm. C | Pyrmont | Montgomery. |
| Morgan, Reuben D | Cleveland | Cuyahoga. |
| Morton, George L | South Newburg | Geauga. |
| Morton, James W | Mt. Ephraim | Noble. |
| Mullay, Thomas H | Columbus | Franklin. |
| Munsey, William C | Columbus | Franklin. |
| Negelspach, Otto | Millersburg | Holmes. |
| Neil, William | Columbus | Franklin. |
| Paiste, Harry P | West Chester, Pa | |
| Perkins, Thomas P | New Moscow | Coshocton. |
| Pleukharp, Ella | Columbus | Franklin. |
| Reichenbach, Emanuel | Apple Creek | Wayne. |
| Reeves, Bernard J | Indianapolis, Ind | |
| Richards, John W | Columbus | Franklin. |
| Riser, Henry E | Columbus | Franklin. |
| Root, Willis J | Andover | Ashtabula. |
| Sawyier, D. W. C., jr | Columbus | Franklin. |
| Schaaf, John C | Delaware | Delaware. |
| Scott, Minnie O | Columbus | Franklin. |
| Seegel, Frank A | Kalida | Putnam. |
| Selby, Augustine D | Bartlett | Washington. |
| Shedd, William | Columbus | Franklin. |
| Shoemaker, Mrs. W. A | Columbus | Franklin. |
| Silcott, James E | Washington C. H | Fayette. |
| Smith, Charles M | Sidney | Shelby. |
| Snyder, David F | Springfield | Clarke. |
| Spurgeon, Hattie | Clintonville | Franklin. |
| Stewart, Harlon L | Norwalk | Huron. |
| Taylor, Joseph R | Columbus | Franklin. |
| Taylor Frank A | Columbus | Franklin. |
| Thompson, Charles H | Oregon | Warren. |
| Wade, Julia | Columbus | Franklin. |
| Wade, William | Columbus | Franklin. |
| Warner, Julia B | Marietta | Washington. |
| Warner, Carrie E | Marietta | Washington. |
| Wells, George M | Cleveland | Cuyahoga. |
| Wilson, Roger C | Georgetown | Brown. |
| Witt, Stella | Columbus | Franklin. |
| Wonders, James C | Zanesfield | Logan. |

# TREASURER'S REPORT.

COLUMBUS, OHIO, *November* 15, 1881.

HON. JAS. B. JAMISON, *President of the Board of Trustees of the Ohio State University:*

DEAR SIR: I hand you herewith my eleventh annual report of the financial transactions of the Ohio State University, for the fiscal year ending this day.

This report, the same as that of last year, embraces –

I. A general cash statement, showing the receipts, expenditures, and balances of cash.

II. The cash transactions pertaining to the sale of the Virginia Military Lands from 1871 to date.

III. A statement showing the condition of the Endowment Fund, held by the State of Ohio, and pledged to the support and maintenance of the Ohio State University.

IV. A full statement of the cash received from whatever source into my hands.

V. A detailed account of disbursements during the year.

Your attention is called to the statement of the Virginia Military Land account, showing a net balance of receipts to date amounting to $8,433.35, which sum is due to the Endowment Fund, and which, it is respectfully suggested, should be certified into the State Treasury unless authority shall be conferred by the General Assembly for a different use of the income from this source.

All of which is respectfully submitted.

HENRY S. BABBITT, *Treasurer.*

## STATEMENT I.

A GENERAL STATEMENT OF CASH ACCOUNTS FOR THE FISCAL YEAR ENDING NOVEMBER 15, 1881.

HENRY S. BABBITT, *Treasurer, in account with the Ohio State University:*

DR.

| | | | |
|---|---|---|---|
| Nov. 16, 1880. | To balance of cash on hand | | $3,098 22 |
| | To cash from the following sources, viz.: | | |
| | From State Treasury on account of the income of the Endowment Fund, balance of sum, accrued in 1880 | $21,445 00 | |

| | | |
|---|---|---|
| On account of $33,922.67, due from same source in 1881 | $6,961 33 | |
| | | $28,406 33 |
| From students' term bills: | | |
| Winter term, 1880–81 | $1,318 25 | |
| Spring term, 1881 | 1,130 00 | |
| Fall term, 1881 | 1,620 00 | |
| Miscellaneous items | 5 35 | |
| | | $4,073 60 |
| From proceeds of notes received for sale of Virginia Military Lands | $3,243 08 | |
| Interest on such notes | 463 35 | |
| Sale of Virginia Military Lands | 3,656 97 | |
| | | $7,363 40 |
| From rent of houses: | | |
| President Orton | $280 00 | |
| Professor Townshend | 300 00 | |
| Professor Derby | 20 00 | |
| | | $600 00 |
| From miscellaneous sources, to wit: | | |
| Prof. S. A. Norton, chemicals, &c., to students | $241 42 | |
| T. E. Miller collected from trespasser | 2 00 | |
| From C. E. Thorne, farm manager, to reimburse funds advanced to farm committee | 650 00 | |
| | | $893 42 |
| From State Treasury, appropriations, viz.: | | |
| For expenses of Trustees | $350 00 | |
| " ordinary repairs | 303 93 | |
| " supplies to mining department | 413 40 | |
| | | $1,067 33 |
| Total receipts during the year | | $42,404 08 |
| Total receipts, including above balance | | $45,502 30 |

CONTRA, CR.

| | | | |
|---|---|---|---|
| Nov. 15, 1881. | By expenditures as follows (for items see detailed statement). | | |
| | For support and maintenance of the University, viz.: | | |
| | For salaries of faculty, teachers, assistants, other officials and regular employes | $28,050 16 | |
| | For expenses of trustees | 446 80 | |
| | For fire-insurance | 711 00 | |
| | For other current expenses | 3,008 72 | |
| | | | $32,216 68 |

| | | |
|---|---|---|
| For furniture and apparatus not included in department supplies | $484 61 | |
| For library | 428 73 | |
| For farm and lawn expenses | 881 60 | |
| For improvements | 316 78 | |
| For repairs | 1,186 72 | |
| For University band | 55 00 | |
| For department supplies | 1.878 35 | |
| | | $5,231 79 |
| For expenses of Virginia Military Lands | | 3,991 48 |
| Total disbursements for the year | | $41,439 95 |
| Balance of cash on hand this day | | 4,062 35 |
| Total receipts this year, including cash on hand November 15, 1880 | | $45,502 30 |
| It is estimated that the expenditures for the ensuing fiscal year will be, for current expenses | | $33,000 00 |
| For other expenses and supplies | | 5,000 00 |
| Total | | $38,000 00 |

This estimate does not include any special expenditures that may be made by authority of, and out of appropriations that may be made by the General Assembly of Ohio.

## STATEMENT II.

### Virginia Military Land Sales.

| | | |
|---|---|---|
| The cash receipts into the treasury from the proceeds of the sales of these lands, as reported to November 15, 1880, were | | $31,424 45 |
| Receipts during fiscal year 1881 | | *7,363 40 |
| Total receipts to November 15, 1881 | | $38,787 85 |
| Total expenses on this account to November 15, 1880, as per report for last year | $14,289 74 | |
| Expenses in 1881 | 3,991 48 | |
| Total expenses to November 15, 1881 | | $18,281 22 |
| Balance, showing net receipts to November 15, 1881 | | $20,506 63 |
| Of this amount, the net receipts to November 15, 1879, were paid into the State Treasury to the credit of the Endowment Fund, as required by law, June 29, 1880 | | $12,073 28 |
| Leaving the net proceeds for the past two years, subject to the direction of the Board, for payment into the State Treasury | | $8,433 35 |

* Note.—The figures on page 12 of this report did not include the *full* year.

## STATEMENT III.

SHOWING THE AMOUNT OF THE OHIO STATE UNIVERSITY ENDOWMENT FUND, COMPUTED IN ACCORDANCE WITH THE PROVISIONS OF THE ACT PASSED FEBRUARY 10, 1870. (Revised Statutes, Sec. 8446.)

| | | | |
|---|---|---|---|
| Amount of fund as principal Jan. 1, 1881, (exclusive of bonds of Franklin county, for $34,500) | | | $525,127 89 |
| Add interest on same for six months, to July 1, 1881, @ 6 per cent. per annum | | $15,753 84 | |
| Add amounts paid in the State treasury by the Treasurer of Franklin county, to comply with the provisions of act of January 20, 1871, as follows: | | | |
| Feb'y 3, 1881, $3,000 and accrued interest | $78 75 | | |
| Mar. 12, " 6,500 " " | 227 50 | | |
| Mar. 14, " 25,000 " " | 855 55 | | |
| Totals ... $34,500 " " | $1,161 80 | 37,661 80 | |
| Add, also, interest on the above sums from their respective dates July 1, 1881, @ 6 per cent. per annum, viz.: | | | |
| $3,078 75 for 4 months and 28 days | $75 96 | | |
| 6,727 50 for 3 months and 18 days | 121 10 | | |
| 25,855 55 for 3 months and 16 days | 456 78 | 653 84 | |
| Total additions first half year | | | 52,069 48 |
| Making a total of | | | $577,197 37 |
| From which is to be deducted the payments made by the State from the income of the fund, since last report, as follows, viz.: | | | |
| Nov. 22, 1880, $2,500, with interest to July 1, 1881, 7 mos., 8 days... | | $90 83 | |
| Dec. 1, 1880, 2,500, " " 7 " ... | | 87 50 | |
| " 31, 1880, 1,445, " " 6 " ... | | 43 35 | |
| Jan. 22, 1881, 3,000, " " 5 " 8 days... | | 79 00 | |
| Mar. 31, 1881, 3,000, " " 3 " ... | | 45 00 | |
| Apr. 15, 1881, 3,000, " " 2 " 15 days... | | 37 50 | |
| May 31, 1881, 3,000, " " 1 " ... | | 15 00 | |
| June 15, 1881, 3,000, " " 0 " 15 days... | | 7 50 | |
| $21,445 | | $405 68 | |
| Total deductions first half year | | | 21,850 68 |
| Leaving amount of new principal July 1, 1881 | | | $555,346 69 |
| Amount of principal July 1, 1881 | | | $555,346 69 |

Upon this sum, interest at the rate of six per cent. per annum, compounded semi-annually on the first of January and July, is payable by the State to the University, under the provisions of sections 8433 and 8446, of the Revised Statutes.

The annual interest charge upon this sum for the year 1881-82, will amount to..... 33,320 80

Heretofore the interest has been computed by the Auditor of State up to the first of January following the close of the fiscal year, and the account is thus complicated by the necessity of treating with two different financial periods; the calculation this year is made to July 1, 1881, only; hereafter it can be made January and July of each year, and the element of uncertainty will be avoided.

Requisitions were made by the Commissioners of the Sinking Fund for the interest accumulations to July 1, 1881, to the amount of $16,961.33. Of this sum there has been drawn from the State treasury the following sums, to wit:

| | |
|---|---|
| August 10, 1881, the sum of | $1,961 33 |
| October 6, " " | 2,500 00 |
| Nov. 15, " " | 2,500 00 |
| Total | $6,961 33 |

Section 7 of the organic act, passed by the Legislature of Ohio, May 1, 1878, requires a list of "the number of professors, officers, teachers and other employes, and the position and compensation of each," to be reported annually.

The following is the roster, with salaries attached, at this date:

| | |
|---|---|
| Walter Q. Scott, President | $2,750 00 |
| Edward Orton, Professor | 2,250 00 |
| S. A. Norton, " | 2,250 00 |
| Norton S. Townshend, Professor | 2,250 00 |
| R. W. McFarland, " | 2,250 00 |
| Albert H. Tuttle, " | 2,250 00 |
| S. W. Robinson, " | 2,250 00 |
| T. C. Mendenhall, " | 2,250 00 |
| Nat. W. Lord, " (conditional) | 2,000 00 |
| John T. Short, " | 1,800 00 |
| S. C. Derby, " | 1,600 00 |
| Wm. R. Lazenby, " | 2,000 00 |
| George Ruhlen, " (military) | 500 00 |
| Wm. A. Mason, Assistant Professor | 1,200 00 |
| Alice Williams, Instructor | 800 00 |
| Albert Allen, Secretary | 1,200 00 |
| H. S. Babbitt, Treasurer | 400 00 |
| Belle Swickard, Assistant Librarian | 125 00 |
| M. Dillon, Janitor | 1,000 00 |
| Jas. P. Milligan, Clerk to President, per year | 75 00 |

| | |
|---|---|
| C. C. Miller, Ass't Teacher, Latin and Greek | 100 00 |
| Belle Swickard, " " | 100 00 |
| D. O'Brien, " Chemical Lab | 150 00 |
| Newton M. Anderson, Ass't Teacher, Dep't of Zoology | ..... |
| W. R. Cherryholmes, " " Physics | ..... ... |

## APPROPRIATIONS.

SECRETARY'S OFFICE, COLUMBUS, O., *October* 28, 1881.

*Dr. Henry S. Babbitt, Treasurer O. S. University:*

DEAR SIR: The following appropriations were made by the Board of Trustees for the fiscal year, 1881, in addition to the appropriation by the General Assembly, as per act of April 18, 1881, ($33,922.67), for the expenditure of the income from the Endowment Fund, for the support and maintenance of the University, to wit:

| | | |
|---|---|---|
| Nov. 19, 1880.—Dep't of | Physics, to be expended by Prof. Mendenhall | $1,000 00 |
| " " | Zoology and Comparative Anatomy | 400 00 |
| " " | Chemistry (library for) | 100 00 |
| " " | Latin and Greek | 100 00 |
| " " | Geology | 50 00 |
| " For | College Band | 25 00 |
| Jan'y 6, 1881.—To | pay Dr. Townshend's traveling expenses attending Farmers' Institutes | 100 00 |
| May 6, " To | purchase chemicals | 500 00 |
| " " To | leader of band | 15 00 |
| " " For | use of Farm Committee | 500 00 |
| " " | purchase of apparatus for Physical Department | 500 00 |
| June 21, " | advertising | 200 00 |
| " " | Library | 300 00 |
| " " | Chemical Laboratory supplies | 300 00 |
| " " | assistant in Chemical Laboratory | 150 00 |
| " " | improvement and material in Mechanical Laboratory | 210 00 |
| " " | Zoological Dep't supplies | 200 00 |
| " " | ventilation in Chemical Department—not to exceed | 125 00 |
| " " | specimens for Geological Museum | 50 00 |
| " " | clerical services in President's room | 75 00 |

Respectfully submitted,

ALBERT ALLEN, *Secretary.*

## STATEMENT IV.

SHOWING IN DETAIL THE CASH RECEIPTS FROM ALL SOURCES DURING THE YEAR ENDING NOVEMBER 15, 1881, BY HENRY S. BABBITT, TREASURER.

| Date. | From whom received, and on what account. | Amount. | Total. |
|---|---|---|---|
| 1880. | | | |
| Nov. 16 | Balance of cash on hand | | $3,098 22 |
| 22 | Samuel W. Brown, Va. Military Land, note | $11 25 | |
| | Daniel Evans, " " | 18 10 | |
| | Elizabeth Holsinger, " pre-emption | 10 00 | |
| | Chas. A. Barton, Agt., " sales | 425 36 | |
| | C. E. Thorne, Farm Manager, reimbursement of money advanced to the Farm Committee | 650 00 | |
| | | | 1,114 71 |
| | State Treasury, income from endowment. | | 2,500 00 |
| Dec. 1 | " " | | 2,500 00 |
| 3 | W. W. Compton, Va. Military Land, note | $15 00 | |
| | " " interest | 1 00 | |
| | Winterstein & Cooper, " note | 33 04 | |
| | | | 49 04 |
| 27 | A. Kissting, " note | $42 50 | |
| | " " interest | 3 30 | |
| | Samuel A. Hoffer, " note (bal.) | 25 45 | |
| | Johnson Allen, " sales | 87 33 | |
| | | | 158 58 |
| 30 | J. B. Fleming, " note | $80 00 | |
| | Alfred McDaniels, " note | 5 20 | |
| | " " interest | 4 80 | |
| | Thomas W. Davis, " note | 31 40 | |
| | J. F. Miles, " notes, 2 ($45 and $81.57) | 126 57 | |
| | J. F. Miles, Virginia Military Land, interest | 10 29 | |
| | Chas. A. Barton, " sales | 159 35 | |
| | President Orton, house-rent November and Dec. | 70 00 | |
| | | | 487 61 |
| 31 | State Treasury, income from endowment | | 1,445 00 |
| 1881. | | | |
| Jan. 15 | Jacob Lowman, Va. Military Land, notes | $35 75 | |
| | Edward Orton, " sales | 252 00 | |
| | | | 287 75 |
| 22 | State Treasury, income from endowment | | 3,000 00 |
| 31 | Samuel Redman, Va. Military Land, note | $13 75 | |
| | " " interest | 2 75 | |
| | A. & J. P. Newman, " notes | 113 00 | |
| | Henry W. Russell, " " | 30 00 | |
| | R. W. McFarland, Bursar, acc't of winter term bills | 488 50 | |
| | | | 678 00 |
| Feb. 4 | Mary and L. C. Damarin, Va. Mil. Land, notes | $329 94 | |
| | " " interest | 17 39 | |
| | | | 347 33 |
| 9 | Henry W. Russell, " note | $17 00 | |
| | R. W. McFarland, Bursar, acc't winter term bills | 720 50 | |
| | | | 737 50 |
| 16 | John Daugherty, Va. Military Land, note | $10 00 | |
| | John McCoy, " " | 11 17 | |
| | " " interest | 89 | |
| | Robert Smith, " note | 31 65 | |
| | " " interest | 2 55 | |
| | | | 56 26 |
| 25 | Chas. A. Barton, " sales | | 199 08 |
| 28 | " " " | | 200 00 |

STATEMENT IV.—Continued.

| Date. | From whom received, and on what account. | Amount. | Total. |
|---|---|---|---|
| 1881. | | | |
| March 10 | W. M. Stephenson, Va. Military Land, note | $18 00 | |
| | James Porter, " interest | 1 80 | |
| | Wm. Park, " " | 2 00 | |
| | President Orton, house rent | 70 00 | |
| | | | $91 80 |
| 17 | Andrew Behne, jr., Va. Military Land, note (bal.) | $91 08 | |
| | " " interest | 8 34 | |
| | | | 99 42 |
| 26 | R. W. McFarland, Bursar, bal. winter term fees | | 109 25 |
| 31 | John Liston, Va. Military Land, note | $20 00 | |
| | J. W. Overturf, for account of amount due from Newman & Simpson on Va. Military Land notes | 12 18 | |
| | Leroy Moss, Va. Mil. Land, note ($10 and int. 60c) | 10 60 | |
| | E. A. Legg, " " | 60 00 | |
| | Chas. A. Barton, " sales | 140 00 | |
| | | | 242 78 |
| 31 | State Treasury, income from endowment | | 3,000 00 |
| April 6 | Chas. A. Barton, Va. Mil. Land, sales | | 185 61 |
| 14 | " " " | $750 00 | |
| | T. E. Miller, trespassing cattle | 2 00 | |
| | J. W. Purdin, Va. Mil. Land, note | 200 00 | |
| | " " interest | 14 10 | |
| | | | 966 10 |
| 15 | State Treasury, income from endowment | | 3,000 00 |
| 20 | James Groom, Va. Mil. Land, note | $26 00 | |
| | " " interest | 2 25 | |
| | | | 28 25 |
| May 11 | P. N. Wickerham, bal. due on Va. Mil. Land note, $17.40 and int., $2.60, less discount of $6, allowed on the land | | 14 00 |
| 18 | G. F. Jarrell, Va. Mil. Land, note | $45 00 | |
| | President Orton, house rent 2 months | 70 00 | |
| | Sylvester Turner, Va. Mil. Land, notes | 27 00 | |
| | " " interest | 5 16 | |
| | | | 147 16 |
| | Geo. Kessinger, " notes (2) | $54 00 | |
| | " " interest | 10 65 | |
| | J. B. McGraw, " note | 3 60 | |
| | | | 68 25 |
| 26 | Prof. N. S. Townshend, house rent 1 year | $300 00 | |
| | David C. Thompson, V. M. Land, note, $46; int., $2.75 | 48 75 | |
| | Wm. G. Beckman, " " | 70 08 | |
| | | | 418 83 |
| 31 | State Treasury, income from endowment | | 3,000 00 |
| June 6 | Daniel Hux, Va. Mil. Land, note | $20 90 | |
| | " " interest | 10 | |
| | Isaac Smalley, " " | 1 75 | |
| | " " note | 19 00 | |
| | M. D. Hibb, " " | 68 00 | |
| | " " interest | 6 25 | |
| | Elizabeth Davis, " 3 notes | 87 00 | |
| | " " interest | 6 20 | |
| | | | 209 20 |
| 10 | W. S. Jones, damage to apparatus | | 5 35 |
| 15 | State Treasury, income from endowment | | 3,000 00 |
| 18 | Prof. McFarland, Bursar, spring term fees: Incidentals .... $895; Chem. Lab'y .. 210; Phys'l " .. 14; Stall rent ..... 11 | | 1,130 00 |

STATEMENT IV.—Continued.

| Date. | From whom received, and on what account. | Amount. | Total. |
|---|---|---|---|
| 1881. | | | |
| June 29 | Chas. A. Barton, Va. Mil. Land, sales | $856 27 | |
| | Prof. S. A. Norton, apparatus to students | 241 42 | |
| | Daniel Hux, bal. due on Va. Mil. Land, note | 1 93 | |
| | | | $1,099 62 |
| July 11 | Samuel A. Hoffer, " note | | 25 00 |
| 15 | Stephen Bond, " " | | 10 00 |
| 26 | W. S. Hall, " " | $26 00 | |
| | " " interest | 4 68 | |
| | | | 30 68 |
| 28 | Johnson Allen, " note | $35 33 | |
| | " " interest | 7 48 | |
| | Bettie Allen, " note | 13 50 | |
| | " " interest | 2 43 | |
| | | | 58 74 |
| 30 | Samuel A. Hoffer, " note | | 52 00 |
| Aug. 10 | State Treasury, income from endowment | | 1,961 33 |
| 15 | Joseph Hart, Va. Mil. Land, interest | | 1 15 |
| | George C. Bryant, " note | $30 00 | |
| | " " interest | 15 00 | |
| | Samuel Johnson, " note | 21 95 | |
| | " " interest | 2 27 | |
| | Henry Carter, " note | 33 33 | |
| | " " interest | 4 17 | |
| | John H. Davis, " note | 6 34 | |
| | " " interest | 66 | |
| | Wasson Muter, " " | 3 00 | |
| | | | 116 72 |
| Sept. 1 | M. C. & L. C. Damarin, " note | $11 46 | |
| | " " int. on sundry notes | 60 08 | |
| | F. J. Misler, " note | 156 66 | |
| | " " interest | 40 74 | |
| | | | 268 94 |
| 23 | Satterfield & Barry, " note | $92 20 | |
| | " " interest | 11 34 | |
| | | | 103 54 |
| Oct. 5 | Jarrett Newman, " note | $40 00 | |
| | E. M. West, " note $17 70 | | |
| | " " interest 2 30 | 20 00 | |
| | Joseph Panley, " note $19 00 | | |
| | " " interest 40 | 19 40 | |
| | Bronson Holton, " interest | 10 00 | |
| | Jacob Butler, " 1st note $24 00 | | |
| | " " acc't 2d note 10 58 | | |
| | " " int. 5 notes 15 42 | 50 00 | |
| | | | 139 40 |
| 6 | State Treasury, income from endowment | | 2,500 00 |
| 8 | Isaac Sole, Va. Military Land, note | $35 00 | |
| | J. F. Compton, " note $22 00 | | |
| | " " interest 1 32 | 25 00 | |
| | " int. on W. W. Compton's n'ts 1 68 | | |
| | | | 60 00 |
| 24 | Jarrett Newman, Va. Mil. Land, note | $5 00 | |
| | A. W. Yankee, " notes (3) | 147 74 | |
| | " " interest | 13 01 | |
| | Chas. A. Barton, " note (on acc't) | 100 00 | |
| | | | 265 75 |

STATEMENT IV.—Continued.

| Date. | From whom received, and on what account. | Amount. | Total. |
|---|---|---|---|
| 1881. | | | |
| Oct 24 | Mary J. Reed, 3 notes Va. Mil. Land, $8.45 each ... | $25 35 | |
| | " 1 note " and bal..... | 49 54 | |
| | " accrued interest on same..... | 25 11 | |
| | | | $100 00 |
| Nov. 2 | S. C. Derby, house rent for October ..... | $20 00 | |
| | R. W. McFarland, Bursar, fall term bills ..... | 1,620 00 | |
| | Geo. F. Jarrell, Va. Mil. Land, note ..... $57 50 | | |
| | " " bal.on ac't 12 34 ... | 84 12 | |
| | " " interest... 14 28 | | |
| | H. W. Russell, " note ..... | 4 30 | |
| | Miles P. Thompson, " note ..... $50 00 | | |
| | " " interest... 9 85 ... | 59 85 | |
| | | | 1,788 27 |
| 15 | State Treasury, income from endowment fund..... | ..... | 2,500 00 |
| | Joseph Hart, Va. Mil. Land, note ..... | $27 86 | |
| | W. M. Stephenson, " " " ..... | 18 00 | |
| | Samuel A. Hoffer, " " ..... | 11 00 | |
| | Abigail Genther, " note..... $27 50 | | |
| | " " interest.... 1 62 ... | 29 12 | |
| | Bronson Holton, " notes ..... $70 50 | | |
| | " " interest..... 8 50 ... | 79 00 | |
| | Erasmus Tucker, " note..... $29 62 | | |
| | " " interest..... 2 80 ... | 32 42 | |
| | James Daugherty, " note..... | 20 24 | |
| | Chas. A. Barton, " interest (balance)..... | 99 14 | |
| | " " cash sales ..... | 391 97 | |
| | Edward Orton, house rent in full ..... | 70 00 | |
| | | | 778 75 |
| | State Treasury, for acc't expenses of Trustees..... | $350 00 | |
| | " " ordinary repairs. ..... | 303 93 | |
| | " " supplies Mining Dep't..... | 413 40 | |
| | | | 1,067 33 |
| | Total receipts, including balance of $3,098.22 on hand Nov. 16, 1880..... | ..... | $45,502 30 |
| | Total disbursements during the year (see Statement V. for details)..... | ..... | 41,439 95 |
| | Balance cash on hand Nov. 15, 1881..... | ..... | $4,062 35 |

## STATEMENT V.

A DETAILED ACCOUNT OF DISBURSEMENTS, BY HENRY S. BABBITT, TREASURER, DURING THE FISCAL YEAR ENDING NOVEMBER 15, 1881.

| Date. | No. of order. | To whom paid. | For what purpose. | Amount. |
|---|---|---|---|---|
| 1880. | | | | |
| Nov. 19 | 437 | C. A. Barton, agent V. M. lands | Salary and expenses | $410 19 |
| | 438 | Alston Ellis | Expenses as Trustee | 23 00 |
| | 439 | S. H. Ellis | " " | 11 60 |
| | 440 | Stephen Johnson | " " | 12 00 |
| | 441 | T. J. Godfrey | " " | 18 15 |
| 24 | 442 | Prof. A. H. Tuttle | Salary for November | 225 00 |
| | 443 | President Edward Orton | " " | 275 00 |
| | 444 | Prof. Sidney A. Norton | " " | 225 00 |
| | 445 | " S. W. Robinson | " " | 225 00 |
| | 446 | " Josiah R. Smith | " " | 160 00 |
| | 447 | " Joseph Millikin | " " | 225 00 |
| | 448 | " Norton S. Townshend | " " | 225 00 |
| | 449 | " R. W. McFarland | " " | 225 00 |
| | 450 | " Luigi Lomia | " " | 60 00 |
| | 451 | " Nat. W. Lord | " " | 130 00 |
| | 452 | " John T. Short | " " | 160 00 |
| | 453 | " Wm. A. Mason, Jr. | " " | 100 00 |
| | 454 | " Alice Williams | " " | 65 00 |
| | 455 | Michael Dillon, janitor | " " | 83 33 |
| 27 | 456 | Jas. B. Jamison | Expenses as Trustee | 15 25 |
| 30 | 457 | A. D. Rodgers, P.M. | Postage for President | 6 00 |
| Dec. 2 | 458 | Thomas Mathew | Balance due for materials | 44 00 |
| 4 | 459 | Jerry Bresnahan | Wages as Lawn-keeper | 35 00 |
| 6 | 460 | P. Hayden | Coke | 8 50 |
| | 461 | Columbus Fire Department | Filling cisterns | 50 00 |
| | 462 | C. J. Wilfing | Work in Mech'l Labor'y | 16 95 |
| | 463 | C. S. Amy | " " | 34 00 |
| | 464 | F. C. Ashinger | Carpentry | 3 50 |
| | 465 | Geo. M. Maris & Co. | Glass for repairs | 40 |
| | 466 | N. E. Lovejoy | Repairing well | 9 75 |
| | 467 | M. J. Lawrence | Sub'n to Ohio Farmer | 3 00 |
| | 468 | Geo. D. Makepeace | Leader of College Band | 25 00 |
| | 469 | Rushmer & Irving | Repairing gun-carriage | 10 00 |
| | 470 | Fred. Keffer, Treas. Horton Literary Society | Repairs | 50 00 |
| | 471 | Cott & Hann | Printing | 5 50 |
| | 472 | Nevins & Myers | Letter-heads | 7 25 |
| | 473 | F. King | Painting blackboards | 5 00 |
| | 474 | Royce & Pulling | Repairing cylinder heads | 20 49 |
| 7 | 475 | Columbus Transfer Co. | Freights | 2 02 |
| 9 | 476 | A. D. Rodgers, P.M. | Postage for Secretary | 9 00 |
| 22 | 477 | Prof. Wm. A. Mason, Jr. | Salary for December | 113 33 |
| | 478 | " A. H. Tuttle | " " | 225 00 |
| | 479 | " Edward Orton | " " | 275 00 |
| | 480 | " Sidney A. Norton | " " | 225 00 |
| | 481 | " Jos. Millikin | " " | 225 00 |
| | 482 | " N. S. Townshend | " " | 225 00 |
| | 483 | " R. W. McFarland | " " | 225 00 |
| | 484 | " Luigi Lomia | " " | 60 00 |
| | 485 | " S. W. Robinson | " " | 225 00 |
| | 486 | " J. R. Smith | " " | 160 00 |
| | 487 | " N. W. Lord | " " | 130 00 |

STATEMENT V—Continued.

| Date. | No. of order. | To whom paid. | For what purpose. | Amount. |
|---|---|---|---|---|
| 1880. | | | | |
| Dec. 22 | 488 | Prof. J. T. Short | Salary for December | $160 00 |
| | 489 | " Alice Williams | " " | 65 00 |
| | 490 | M. Dillon, Janitor | " " | 83 33 |
| | 491 | Albert Allen, Secretary | " " | 100 00 |
| | 492 | Sioux Glover | " Ass't Librarian | 25 00 |
| | 493 | David O'Brine | " Tutor | 50 00 |
| | 494 | H. L. Wilgus | " " | 25 00 |
| | 495 | Chas. M. Lewis | " " | 50 00 |
| | 496 | Strobridge Lithogr.ap'ng Co | Engraving and printing | 152 75 |
| 23 | 497 | R. W. McFarland | Pd. for labor on wind-mill | 45 00 |
| 28 | 498 | A. D. Rodgers, P.M. | Postage for President | 10 00 |
| Jan. 4 | 499 | Thos. Fitzgerald | Setting gas retorts | 9 45 |
| 1881. | 500 | Stacy Manufacturing Co | Gas retort | 60 50 |
| | 501 | Miller, Metcalf & Parker | Mechanical supplies | 6 35 |
| | 502 | R. B. Adams | Lumber | 3 45 |
| | 503 | Columbus Transfer Co. | Freights | 11 86 |
| | 504 | Albert Allen | Teleg'h & express charges | 3 30 |
| | 505 | A. H. Smythe | Books for Library | 55 25 |
| | 506 | S. W. Robinson | Supplies Mech. Dep't | 6 00 |
| | 507 | Prof. Tuttle | " Zoolog. " | 5 35 |
| | 508 | Royce & Pulling | Repairing cylinders | 3 75 |
| | 509 | H. C. McClelland & Co | Books for Library | 9 60 |
| | 510 | Elliott Jones & Co | Stationery | 4 65 |
| | 511 | Wm. Taylor | Cement | 1 75 |
| | 512 | Kilbourne, Jones & Co | Department supplies | 26 09 |
| | 513 | B. D. Potts | Wind-mill fixtures | 133 23 |
| | 514 | Abbott, Montgom'y & Ston'r | Hardware | 8 66 |
| | 515 | Lyonsdale Coal Co | Coal | 289 88 |
| | 516 | Geo. M. Maris & Co | Glass | 1 10 |
| | 517 | Edward Orton | Incidental expenses | 40 49 |
| | 518 | Prof. Tuttle | Physiolog'l Dep't supplies | 214 59 |
| 6 | 519 | Alston Ellis | Expenses as Trustee | 15 00 |
| | 520 | Wm. H. Leete | Settlement of V. M. Land case in Franklin Com. Pleas Court | 2,284 33 |
| | 521 | Halm, Bellows & Butler | Table for Phys. Laboratory | 60 00 |
| | 522 | Stephen Johnston | Expenses as Trustee | 11 50 |
| | 523 | T. J. Godfrey | " " | 19 05 |
| | 524 | Jas. B. Jamison | " " | 15 00 |
| 8 | 525 | Eimes & Amend | Supplies Prof. Tuttle's dep't | 31 54 |
| | 526 | S. W. Robinson | Appleton's Dic. of Mechs. | 14 00 |
| | 527 | Geo. D. Makepeace | Leader of O. S. U. band | 15 00 |
| 15 | 528 | Albert Allen, Secretary | 1 month's salary | 100 00 |
| 20 | 529 | S. H. Ellis | Expenses as Trustee | 39 90 |
| | 530 | Stephen Johnson | " " | 10 75 |
| | 531 | Jas. B. Jamison | " " | 14 75 |
| 21 | 532 | S. H. Ellis | Car tickets for Legis. Com's. | 4 00 |
| 25 | 533 | Prof. Norton | Salary for January | 225 00 |
| | 534 | Fred Keffer | " as tutor | 15 00 |
| | 535 | Prof. Tuttle | " for January | 225 00 |
| | 536 | " Short | " " | 160 00 |
| | 537 | " Millikin | " " | 225 00 |
| | 538 | " Lord | " " | 130 00 |
| | 539 | President Orton | " " | 275 00 |
| | 540 | Prof. Townshend | " " | 225 00 |

STATEMENT V.—Continued.

| Date. | No. of order. | To whom paid. | For what purpose. | Amount. |
|---|---|---|---|---|
| 1881. | | | | |
| Jan. 25 | 541 | Prof. McFarland | Salary for January | $225 00 |
| | 542 | " Robinson | " " | 225 00 |
| | 543 | " Lomia | " " | 60 00 |
| | 544 | " Smith | " " | 160 00 |
| | 545 | " Mason | " " | 120 00 |
| | 546 | " Williams | " " | 65 00 |
| | 547 | Michael Dillon | " " | 83 33 |
| 28 | 548 | E. E. Lyon | Repairing blackboards | 5 20 |
| Feb'y 5 | 549 | R. W. McFarland | Wind mill expenses | 117 78 |
| 7 | 550 | E. B. Armstrong | Repairing tank | 11 70 |
| | 551 | Columbus Transfer Co. | Freight | 15 58 |
| | 552 | Ed. Hughes | Labor | 20 62 |
| | 553 | Columbus Telephone Co. | Rent of instruments | 16 39 |
| | 554 | Royce & Pulling | Steam-pumps | 102 04 |
| | 555 | E. R. Kirk | Repairing chairs | 18 25 |
| | 556 | N. E. Lovejoy | Lumber for wind-mill | 26 14 |
| | 557 | Comly & Francisco | Printing vouchers | 8 50 |
| | 558 | Lyonsdale Coal Co | 182 $\frac{1}{20}$ tons coal | 420 56 |
| | 559 | Wm. Halley | Plumbing | 97 78 |
| | 560 | Void | | 0 00 |
| | 561 | S. P. Watt | Laboratory work | 6 36 |
| | 562 | Hayden & Baker | Iron cuttings, Department supplies | 24 12 |
| | 563 | Geo. M. Maris & Co | Step-ladder, Dep't supplies | 2 75 |
| | 564 | Brown & Sharp Manuf'g Co. | Vitrified wheel, " | 4 05 |
| | 565 | Columbus B. and S. P. Wks. | Flanges, " | 3 57 |
| | 566 | J. K. McDonald | Repairing blackboards | 11 00 |
| | 567 | Stephen Johnston | Expenses as Trustee | 6 75 |
| 10 | 568 | Jas. B. Jamison | " " | 12 55 |
| 14 | 569 | Albert Allen, Sec'y | Salary | 100 00 |
| 16 | 570 | H. S. Babbitt, Treasurer | Salary for 3 months | 100 00 |
| 18 | 571 | Prof. Millikin | On account of salary | 125 00 |
| 24 | 572 | " McFarland | Salary for February | 225 00 |
| | 573 | Pres't Orton | " " | 275 00 |
| | 574 | Prof. Norton | " " | 225 00 |
| | 575 | " Millikin | Balance salary for Feb'y | 100 00 |
| | 576 | " Townshend | Salary for February | 225 00 |
| | 577 | " Tuttle | " " | 225 00 |
| | 578 | " Lomia | " " | 60 00 |
| | 579 | " Robinson | " " | 225 00 |
| | 580 | " Smith | " " | 160 00 |
| | 581 | " Lord | " " | 130 00 |
| | 582 | " Short | " " | 160 00 |
| | 583 | " Mason | " " | 120 00 |
| | 584 | " Alice Williams | " " | 65 00 |
| | 585 | Michael Dillon | Janitor for February | 83 33 |
| | 586 | W. S. Jones | Ass't in Laboratory $\frac{1}{2}$ term | 50 00 |
| 28 | 587 | C. M. Lewis | Tutor in Languages " | 37 50 |
| 28 | 588 | H. L. Wilgus | " Mathematics " | 25 00 |
| March 12 | 589 | Alston Ellis | Expenses as Trustee | 15 00 |
| 12 | 590 | Harry Hyatt | Ass't in President's room | 25 00 |
| | 591 | Jerry Bresnahan | Work on retorts | 7 50 |
| | 592 | E. R. Kirk | Carpentry | 66 95 |

STATEMENT V.—Continued.

| Date. | No. of order. | To whom paid. | For what purpose. | Amount. |
|---|---|---|---|---|
| 1881. | | | | |
| March 12 | 593 | Prof. Tuttle | Supplies for Physic'l Laboratory, $121.36. Expenses of dep't, 27.68 Incidentals—current expenses, $19.70 | $168 74 |
| | 594 | Edward Hughes | Setting retort | 10 00 |
| | 595 | Wassall Fire Clay Co | Fire-bricks and clay | 8 75 |
| | 596 | Geo. W. Gleason | Books for Library, $47.50 Liquid slating, 22.14 | 69 64 |
| | 597 | Lyonsdale Coal Co | 60 $\frac{1}{2}\frac{3}{4}$ tons coal | 139 88 |
| | 598 | S. E. Samuel & Co | Chemicals | 13 83 |
| | 599 | Columbus B. and S. P. Wks. | Pump | 2 50 |
| | 600 | Nevins & Myers | Paper and printing | 24 05 |
| | 601 | A. Thompson | Wind-mill | 150 00 |
| | 602 | Fred. Marvin | Work in laboratory | 11 20 |
| | 603 | Cumberland Fire Br'k Wks. | Clay retorts | 53 75 |
| | 604 | N. Lovejoy & Son | Lumber | 4 05 |
| | 605 | Edward Orton, President | Farmers' Institute expenses, $17.45. Library, $7.50. Incidentals, $30.99 | 55 94 |
| | 606 | C. S. Amy | One night's work | 1 50 |
| | 607 | R. W. McFarland | Wind-mill expenses | 11 46 |
| | 608 | John Shea | Supplies for Janitor | 7 42 |
| | 609 | A. D. Rodgers, P. M. | Postage on reports | 73 80 |
| | 610 | Prof. Townshend | Farmer's Inst. ex., $36.20 Postage 9.93 | 46 13 |
| | 611 | Columbus Transfer Co | Freights | 22 39 |
| | 612 | J. V. Stormay | Autotypes (art department supplies) | 13 00 |
| | 613 | W. H. Ferguson | Cabinet, draw'g screen, &c. | 61 00 |
| | 614 | P. Hayden | Coal | 4 50 |
| | 615 | Wm. Halley | Plumbing | 17 78 |
| | 616 | Scioto Boiler Works | Steam-fitting, (repairs) | 17 20 |
| | 617 | George D. Makepeace | Leader of b nd | 15 00 |
| 17 | 618 | W. S. Jones | Tutor in Physics | 50 00 |
| | 619 | David O'Brine | " Chemistry | 75 00 |
| | 620 | H. L. Wilgus | " Mathematics | 25 00 |
| | 621 | Miss Sioux Glover | Librarian | 37 50 |
| | 622 | Belle Swickard | Ass't in Latin | 37 50 |
| | 623 | Fred Keffer | " Physics | 10 00 |
| | 624 | C. W. Lewis | " Latin and Greek | 37 50 |
| 22 | 625 | D. B. Schriver | 2 door springs | 3 00 |
| 25 | 626 | Edward Orton | Salary for March | 275 00 |
| | 627 | Prof. Norton | " | 225 00 |
| | 628 | " Lord | " | 130 00 |
| | 629 | " Millikin | " | 225 00 |
| | 630 | " Townshend | " | 225 00 |
| | 631 | " McFarland | " | 225 00 |
| | 632 | " Tuttle | " | 225 00 |
| | 633 | " Lomia | " | 60 00 |
| | 634 | " Robinson | " | 225 00 |
| | 635 | " Smith | " | 160 00 |
| | 636 | " Short | " | 160 00 |
| | 637 | " Mason | " | 120 00 |

STATEMENT V.—Continued.

| Date. | No. of order. | To whom paid. | For what purpose. | Amount. |
|---|---|---|---|---|
| 1881. | | | | |
| March 25 | 638 | Prof. Williams | Salary for March | 65 00 |
| | 639 | Michael Dillon, janitor | " | 83 33 |
| 30 | 640 | A. D. Rodgers, Postmaster | Postage on reports | 20 00 |
| April 2 | 641 | Alston Ellis | Expenses as Trustee | 16 00 |
| 4 | 642 | E. R. Kirk | Carpentry | 19 10 |
| | 643 | Wm. Halley | Plumbing | 52 67 |
| | 644 | J. F. Earhart | Printing tabs | 4 00 |
| | 645 | A. H. Smythe | Books for Library | 60 15 |
| | 646 | Geo. M. Maris & Co | Glass and lead | 2 00 |
| | 647 | T. H. Schneider | Laboratory supplies | 4 95 |
| | 648 | Electric Manufacturing Co | Electric bells | 10 80 |
| | 649 | Ohio Farmer | Advertising lectures | 7 50 |
| | 650 | City Boiler Works | Bal. on engine | 1 00 |
| | 651 | Siebert & Lilley | Binding reports | 12 00 |
| | 652 | John A. Rea, agent | Insurance on Laboratory | 22 50 |
| 9 | 653 | Albert Allen, Secretary | Salary | 100 00 |
| 11 | 654 | F. Kœnig | Painting walls in art rooms | 38 50 |
| 19 | 655 | Fred Keffer | Ass't in Physics | 25 00 |
| 27 | 656 | President Orton | Salary for April | 275 00 |
| | 657 | Prof. Norton | " | 225 00 |
| | 658 | " Millikin | " | 225 00 |
| | 659 | " Townshend | " | 225 00 |
| | 660 | " McFarland | " | 225 00 |
| | 661 | " Tuttle | " | 225 00 |
| | 662 | " Lomia | " | 60 00 |
| | 663 | " Robinson | " | 225 00 |
| | 664 | " Smith | " | 160 00 |
| | 665 | " Lord | " | 130 00 |
| | 666 | " Short | " | 160 00 |
| | 667 | " Mason | " | 120 00 |
| | 668 | " Williams | " | 65 00 |
| | 669 | Michael Dillon, janitor | " | 83 33 |
| | 670 | Prof. N. P. Morgan | " | 150 00 |
| | 671 | Albert Allen, Secretary | Salary to April 15 | 100 00 |
| May 7 | 672 | Stephen Johnston | Expenses as Trustee | 13 50 |
| | 673 | T. J. Godfrey | " | 16 25 |
| | 674 | S. H. Ellis | " | 10 30 |
| | 675 | James B. Jamison | " | 13 50 |
| | 676 | Alston Ellis | " | 17 00 |
| | 677 | E. R. Kirk | Carpentering | 9 63 |
| | 678 | J. K. McDonald | Plastering | 12 00 |
| | 679 | Royce & Pulling | Rubber packing | 7 85 |
| | 680 | Washington Townsend | 2 days' work | 3 00 |
| | 681 | Columbus Nursery | Trees for campus | 19 40 |
| | 682 | Sam'l Shilling | Supplies for Mech. Lab | 24 56 |
| | 683 | Strobridge Lithograph. Co. | Ten diplomas | 10 00 |
| | 684 | S. P. Watt | Supplies for Mech. Lab | 10 09 |
| | 685 | Wassell Fire-Clay Co | Bricks and clay | 2 50 |
| | 686 | Prof. McFarland | Paid laborers' wages | 31 47 |
| | 687 | Prof. S. A. Norton | Chem. Labor'y supplies | 168 33 |
| | 688 | C. M. Beach | Work in Art room | 5 40 |
| | 689 | Clark & Fahey | Repairing scales, &c | 63 19 |
| | 690 | Prof. N. S. Townshend | Exp. at Farmers' Institutes | 56 30 |
| | 691 | Stitt, Price & Co. | Lime | 2 50 |
| | 692 | Lyonsdale Coal Co | 74 4/20 tons coal | 171 87 |
| 10 | 693 | C. E. Thorne, Farmer | Farm expenses | 500 00 |

STATEMENT V.—Continued.

| Date. | No. of order. | To whom paid. | For what purpose. | Amount. |
|---|---|---|---|---|
| 1881. | | | | |
| May 10 | 694 | Columbus Telephone Co | Rent to July 1 | $12 50 |
| 14 | 695 | C. M. Lewis | Ass't in Lat. & Gr., ½ term | 37 50 |
| | 696 | W. S. Jones | " Physics, " | 50 00 |
| | 697 | H. L. Wilgus | Services in Pres't's room | 12 50 |
| 20 | 698 | A. D. Rodgers, P. M | Postage for President | 7 00 |
| 25 | 699 | Prof. Lord | Salary for May | 130 00 |
| | 700 | " Townsend | " | 225 00 |
| | 701 | Pres't Orton | " | 275 00 |
| | 702 | Prof. Norton | " | 225 00 |
| | 703 | " Millikin | " | 225 00 |
| | 704 | " McFarland | " | 225 00 |
| | 705 | " Tuttle | " | 225 00 |
| | 706 | " Robinson | " | 225 00 |
| | 707 | " Lomia | " | 60 00 |
| | 708 | " Smith | " | 160 00 |
| | 709 | " Short | " | 160 00 |
| | 710 | " Mason | " | 120 00 |
| | 711 | " N. P. Morgan | " | 150 00 |
| | 712 | " Alice Williams | " | 65 00 |
| 26 | 713 | Michael Dillon | Janitor for May | 83 33 |
| | 714 | Albert Allen | Sec'y " | 100 00 |
| June 7 | 715 | Miss Sioux Glover | Salary as Librarian | 37 50 |
| | 716 | Geo. Rhoades | Lawn-keeper | 26 90 |
| 10 | 717 | Alston Ellis | Expenses as Trustee | 16 00 |
| | 718 | Pres't Orton | Pd. for Library $87 43<br>" Geolo. Dep't, 37 83<br>" Curr't Exp., 35 05 | 160 31 |
| | 719 | John Shea | Coal-oil | 5 00 |
| | 720 | Nevins & Myers | Paper and printing | 17 00 |
| | 721 | Thos. J. Hand | A. J. C. C. Reg. for Library | 3 75 |
| | 722 | S. W. Robinson | Supplies for Med. Dep't | 6 30 |
| | 723 | J. R. Smith | Rubber stamps | 2 16 |
| | 724 | Prof. Townshend | Repairs to residence | 75 00 |
| | 725 | Royce & Pulling | Bolts for retorts | 1 40 |
| | 726 | Karl Walch | Flowering-plants | 14 80 |
| | 727 | W. S. Jones | Asst't in Physics, ½ term | 50 00 |
| 11 | 728 | C. M. Lewis | " Lat. & Gr., ½ term | 37 50 |
| 18 | 729 | Prof. Millikin | Salary for June | 225 00 |
| | 730 | Pres't Orton | " | 275 00 |
| | 731 | Prof. Norton | " | 225 00 |
| | 732 | " McFarland | " | 225 00 |
| | 733 | " Mason | " | 120 00 |
| | 734 | " Tuttle | " | 225 00 |
| | 735 | " Townshend | " | 225 00 |
| | 736 | " Lomia | " | 60 00 |
| | 737 | " Robinson | " | 225 00 |
| | 738 | " Smith | " | 160 00 |
| | 739 | " Lord | " | 130 00 |
| | 740 | " Short | " | 160 00 |
| | 741 | " Williams | " | 65 00 |
| | 742 | Dan'l O'Brine | Ass't in Chemistry | 50 00 |
| | 743 | H. L. Wilgus | Services in Pres't's room | 12 50 |
| | 744 | Prof. McFarland | " as Bursar | 25 00 |
| 20 | 745 | M. N. Mix, Treas | Tables for art rooms | 8 00 |

STATEMENT V.—Continued.

| Date. | No. of order. | To whom paid. | For what purpose. | Amount. |
|---|---|---|---|---|
| 1881. | | | | |
| June 22 | 746 | S. H. Ellis | Expenses as Trustee | $14 60 |
| 24 | 747 | J. B. Jamison | " | 25 00 |
| | 748 | Lucius B. Wing | " | 11 00 |
| | 749 | T. J. Godfrey | " | 17 30 |
| | 750 | Chas. A. Barton | Exp's as ag't V. M. Lands | 334 23 |
| | 751 | Chas. A. Barton | 7 months' salary as ag't V. M. Lands | 420 00 |
| 25 | 752 | C. F. Marvin | Services Mech. Lab'y | 16 87 |
| | 753 | R. W. McFarland | Superintending lawn | 25 00 |
| | 754 | same | Expenses of same | 7 93 |
| | 755 | S. E. Samuel & Co | Alcohol | 2 55 |
| | 756 | O. A. B. Senter & Co | Paper trays | 6 00 |
| | 757 | C. E. Thorne | Work on lawn | 62 62 |
| | 758 | Belle Swickard | Ass't in Latin and Greek | 37 50 |
| | 759 | Cumberland Firebrick w'ks | 2 gas retorts | 47 50 |
| | 760 | S. A. Norton | Chemicals | 83 78 |
| 27 | 761 | M. Dillon, janitor | Salary for June | 83 33 |
| | 762 | Prof. A. P. Morgan | " | 150 00 |
| 30 | 763 | A. D. Rodgers, P.M. | Postage for President | 9 00 |
| July 2 | 764 | Geo. Rhoades | Work on lawn | 33 65 |
| 11 | 765 | Harvey Bancroft, agt | Fire Insurance | 92 00 |
| 13 | 766 | E. M. Van Harlingen, agt | " | 89 50 |
| | 767 | Wood & Graham, agts | " | 74 00 |
| 14 | 768 | John A. Rea, agt | " | 177 50 |
| | 769 | S. M. Shedd, agt | " | 137 50 |
| 16 | 770 | Prof. McFarland | Expressage on Telescope | 5 00 |
| 18 | 771 | F. Koenig | Kalsomining Laboratory | 12 71 |
| 19 | 772 | A. D. Rodgers, P. M. | P. O. stamps | 25 00 |
| 20 | 773 | T. Ewing Miller | Expenses as Trustee | 10 10 |
| | 774 | Albert Allen, Sec'y | Salary to 15th inst | 200 00 |
| 21 | 775 | Sam'l Thompson, agt | Fire Insurance | 13 00 |
| 25 | 776 | Columbus Telephone Co | Rent to Oct 1 | 12 50 |
| 30 | 777 | M. Dillon, janitor | Salary for July | 83 33 |
| August 2 | 778 | Harvey Bancroft, agt | Fire Insurance | 105 00 |
| 3 | 779 | Geo. Rhoades | Work on lawn | 30 33 |
| 4 | 780 | John McDonald | Plastering | 17 50 |
| | 781 | Wm. Halley | Plumbing | 19 67 |
| | 782 | Edward Hughes | Setting retorts | 5 50 |
| | 783 | Edward Orton | Commencement expenses | 5 85 |
| | 784 | Edward Orton | Sundry incidental exp'nses | 63 83 |
| | 785 | Columbus Transfer Co | Freights | 19 73 |
| | 786 | Siebert & Lilley | Pencils, etc | 3 00 |
| | 787 | Geo. W. Gleason | Programs | 9 80 |
| | 788 | Slade & Kelton | Lumber | 80 14 |
| | 789 | Abbott, Montgom'y & Stoner | Hardware dep't supplies | 41 45 |
| | 790 | A. Clark & Son | Telescope | 325 00 |
| 15 | 791 | Henry S. Babbitt, Treas. | 6 mos. salary to date $200 / Paid for postage 7 | 207 00 |
| 17 | 792 | Albert Allen, Sec'y | One month's salary to date | 100 00 |
| | 793 | John Shea | Supplies for Janitor | 46 45 |
| 27 | 794 | Columbus Police Com'rs | Policemen (3) at commencement | 15 00 |
| 29 | 795 | M. Dillon, janitor | Salary for August | 83 33 |
| Sept. 1 | 796 | George Rhoades | Keeping lawn | 29 17 |
| | 797 | S. H. Ellis | Expenses as Trustee | 13 00 |

STATEMENT V.—Continued.

| Date. | No. of order. | To whom paid. | For what purpose. | Amount. |
|---|---|---|---|---|
| 1881. | | | | |
| Sept. 1 | 798 | Jas. B. Jamison | Expenses as Trustee | $13 00 |
| | 799 | Albert Allen, Sec'y | On salary | 50 00 |
| 16 | 800 | Lewis Baker | Setting retorts, etc | 92 75 |
| | 801 | Washington Townsend | Attending mason—repairs | 36 00 |
| 17 | 802 | Wm. A. Mason, Jr | Art dep't supplies | 18 18 |
| 19 | 803 | Albert Allen, Sec'y | Salary to 15th | 50 00 |
| 22 | 804 | W. & L. E. Gurley | Repairing solar attachment | 3 00 |
| 28 | 805 | Chalmers, Spence & Co | Repairs | 28 80 |
| | 806 | Patton Manufacturing Co | Department supplies | 11 15 |
| | 807 | Walter Q. Scott, Pres't | Salary for September | 275 00 |
| | 808 | Prof. Edward Orton | " | 225 00 |
| | 809 | " S. A. Norton | " | 225 00 |
| | 810 | " N. S. Townshend | " | 225 00 |
| | 811 | Prof. R. W. McFarland | " | 225 00 |
| | 812 | " A. H. Tuttle | " | 225 00 |
| | 813 | " S. W. Robinson | " | 225 00 |
| | 814 | " T. C. Mendenhall | " | 225 00 |
| | 815 | " N. W. Lord | " | 100 00 |
| | 816 | " J. T. Short | " | 180 00 |
| | 817 | " S. C. Derby | " | 160 00 |
| | 818 | " Wm. R. Lazenby | " | 200 00 |
| | 819 | Lieut. George Ruhlen | " | 50 00 |
| | 820 | Prof. Wm. A. Mason, Jr | " | 120 00 |
| | 821 | " Alice K. Williams | " | 65 00 |
| | 822 | C. M. Beach | Attending mason | 38 50 |
| | 823 | Michael Dillon, janitor | Salary for September | 83 33 |
| Oct. 1 | 824 | George Rhoades | Lawn-keeper | 32 66 |
| 5 | 825 | Wm. A. Hershiser | Lumber | 23 14 |
| | 826 | S. P. Watt | Carpentry | 95 85 |
| | 827 | Edwin Alden & Bros | Advertising | 189 50 |
| | 828 | W. P. Harrison Pump Co | Pump | 10 00 |
| | 829 | Nevins & Myers | Circulars | 28 40 |
| | 830 | Columbus Transfer Co | Freight | 6 69 |
| | 831 | McCune, Lonnis & Griswold | Glass | 1 05 |
| | 832 | Kelley & Co | Plumber's materials, Mech. Lab'y | 69 16 |
| | 833 | Slade & Kelton | Lumber | 10 20 |
| | 834 | Geo. Rhoades | 3 days' work | 4 05 |
| | 835 | Kilbourne, Jones & Co | Nails—Mech. Lab'y | 3 10 |
| | 836 | C. M. Beach | 4½ days' work | 9 63 |
| | 837 | Wassall Fire Clay Co | Bricks and clay | 45 03 |
| | 838 | City Boiler Works | Repairing boiler | 15 94 |
| | 839 | J. & H. Berge | Crucibles for Mining dep't | 20 00 |
| | 840 | Albert Allen | Supplies for office | 3 30 |
| | 841 | Myers & Brickell | Advertising | 5 25 |
| | 842 | J. K. McDonald | Carriage hire | 5 00 |
| | 843 | Osborn & Co | Repairing carpet | 17 25 |
| | 844 | Powell & McDonald | Sink, for farmer | 5 75 |
| | 845 | Cott & Hann | Examination papers | 3 50 |
| | 846 | F. Koenig | Lumber | 3 00 |
| | 847 | Greenwood Machine Co | Castings for Mech'l Lab'ry | 5 70 |
| | 848 | Wm. Taylor | Cement | 12 35 |
| | 849 | Prof. A. H. Tuttle | Department supplies | 33 80 |
| | 850 | Stitt, Price & Co | Lime for farmer | 4 00 |
| | 851 | R. W. McFarland | P'd for care of gates $10 00<br>Paid for carpentery 1 80 | 11 80 |

STATEMENT V.—Continued.

| Date. | No. of order. | To whom paid. | For what purpose. | Amount. |
|---|---|---|---|---|
| 1881. | | | | |
| October 5 | 852 | Siebert & Lilley | Blank books | 9 75 |
| | 853 | J. F. Earhart & Co | 100 printed postals | 1 75 |
| 8 | 854 | Albert Allen, Secretary | Account of salary | 75 00 |
| | 855 | Columbus Telephone Co | Rent of telephone | 12 50 |
| 22 | 856 | Belle Swickard | Assistant Librarian | 50 00 |
| 25 | 857 | Walter Q. Scott, Pres't | Salary for October | 275 00 |
| | 858 | Edward Orton | " " | 225 00 |
| | 859 | Sidney A. Norton | " " | 225 00 |
| | 860 | N. S. Townshend | " " | 225 00 |
| | 861 | R. W. McFarland | " " | 225 00 |
| 26 | 862 | Albert H. Tuttle | " " | 225 00 |
| | 863 | S. W. Robinson | " " | 225 00 |
| | 864 | T. C. Mendenhall | " " | 225 00 |
| | 865 | N. W. Lord | " " | 100 00 |
| | 866 | John T. Short | " " | 180 00 |
| | 867 | S. C. Derby | " " | 160 00 |
| | 868 | Wm. R. Lazenby | " " | 200 00 |
| | 869 | Lieut. Geo. Ruhlen | " " | 50 00 |
| | 870 | Wm. A. Mason, Jr | " " | 120 00 |
| | 871 | Alice Williams | " " | 65 00 |
| | 872 | Michael Dillon, janitor | " " | 83 33 |
| Nov. 1 | 873 | J. F. Earhart & Co | Printing for Hortic'l Dep't | 12 50 |
| | 874 | Kilbourne, Jones & Co | Supplies " " | 3 69 |
| | 875 | C. T. Pfaff & Co | " " " | 3 40 |
| | 876 | W. & L. E. Gurley | Repairing compass | 3 25 |
| | 877 | R. W. McFarland | Department supplies | 5 45 |
| | 878 | George Rhoades | Care of lawn | 32 67 |
| | 879 | Royce & Pulling | Repairing mower | 1 25 |
| | 880 | Albert H. Tuttle | Books, Physiolog'l Library | 105 67 |
| | 881 | Abbott, Montgo'ry & Stoner | Supplies for janitor | 12 11 |
| | 882 | Columbus Transfer Co | Freights | 14 44 |
| | 883 | Wm. Halley | Sinks in dormitory | 49 95 |
| | 884 | Midland Telephone Co | Use of telephones, etc | 39 88 |
| | 885 | S. E. Samuel & Co | Chemicals | 5 18 |
| | 886 | J. Porter Milligan | Stamps for President | 10 60 |
| | 887 | A. H. Symthe | Books for library | 26 12 |
| 7 | 888 | Albert Allen | Ink and pencils | 1 90 |
| | 889 | A. H. Tuttle | Laboratory supplies | 157 17 |
| | 890 | Adams Express Co | Express on apparatus | 5 80 |
| | 891 | Lyonsdale Coal Co | $164\frac{155}{200}$ tons coal | 391 92 |
| | 892 | C. R. Vanderburg | Repairs at dormitory | 10 00 |
| | 893 | Comly, Francisco & Co | Advertising | 4 50 |
| | 894 | Wm. Halley | Plumbing in Chemi'l Dep't | 40 05 |
| | 895 | Kauffman, Lattimer & Rising | Supplies for Physical Laboratory | 37 04 |
| | 896 | Kilbourne, Jones & Co | same | 33 05 |
| | 897 | C. F. Marvin | Labor | 3 00 |
| 9 | 898 | H. S. Babbitt | 3 months' salary ... $100 00<br>Postage ... 3 00 | 103 00 |
| | 899 | Albert Allen | Salary | 125 00 |
| | 900 | A. H. Smythe | Books for library | 9 60 |
| 11 | 901 | Chas. A. Barton, agt. V. M. Lands | Six months' salary. $300 00<br>Expenses ... 242 73 | 542 73 |
| | | Total disbursements | | $41,439 95 |

| | |
|---|---|
| Total receipts as per statement IV | $45,502 30 |
| Total disbursements as above | 41,439 95 |
| Balance of cash on hand this day | $4,062 35 |

HENRY S. BABBITT,
*Treasurer, Ohio State University.*

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COLUMBUS, O., *November* 11, 1881.

*To the Board of Trustees of the Ohio State University:*

Your committee to whom was referred the report of the Treasurer, with vouchers, would report that we have examined the same in connection with the certificates and orders of the Secretary, and they are hereby approved.

Very respectfully,

T. J. GODFREY,
S. H. ELLIS,
*Finance Committee.*

# FARM DEPARTMENT.

## REPORT OF FARM COMMITTEE.

*To the Board of Trustees of the Ohio State University:*

Your Farm Committee report that the unexpended balance of appropriations in the hands of the committee at the beginning of the past year has been expended, as will more fully appear in the report of the Farm Manager, herewith submitted.

The accounts and vouchers of the Farm Manager have been compared, and are found correct.

On the 1st of October, Mr. Charles E. Thorne, who had asked to be released that he might accept a very desirable and influential position on the editorial staff of one of our most widely circulated agricultural papers, left the employ of the University.

The Committee sets a high estimate on Mr. Thorne's fidelity, intelligence and business qualities, and they recognize the fact that his administration of the University farm has been a source of strength to the institution.

The experimental work done on the farm the past year has been highly satisfactory, and we recommend that the Board make every reasonable effort for appropriations to enable the Committee to make the farm more exclusively experimental.

J. B. JAMISON,
S. H. ELLIS,
T. J. GODFREY,
*Farm Committee.*

## REPORT OF FARM MANAGER.

*Hon. James B. Jamison, Chairman Farm Committee, Ohio State University:*

DEAR SIR: I herewith submit my Fourth Annual Report of the operations of the Farm Department of the Ohio State University, the same being for the year ending October 31, 1881.

The season of 1881 has been marked throughout the larger portion of the United States by a drouth, almost unprecedented in its extent and duration, the effect of which, on this farm, has been to materially shorten our crops of corn, late pasturage and vegetables; while our wheat yield has been lowered from an average of twenty-seven bushels per acre for the four previous seasons, to less than twenty bushels for this season, owing to the unfavorable conditions for seeding caused by the drouth of the fall of 1880. The cost of producing and harvesting these inferior crops has, moreover,

been materially increased by the advance in the price of labor, due to the competition engendered by the activity in other lines of business. These causes combined will prevent the showing of any great pecuniary profit from the agricultural operations of the year.

In the following statement ("A,") is given an epitome of all the transactions of this department for the year. In this statement the first and last columns are respectively the inventories of plant on hand at the beginning and end of the year; the second column shows the entire expenditures, and the fifth column the total sales of the year; the third column gives the total production of the farm, and the fourth column the total consumption of farm produce, labor and expense in the production of the results shown in the third, fifth and sixth columns, including the depreciation in value of live stock and implements.

# STATEMENT. "A".

SHOWING THE PLANT ON HAND AT THE BEGINNING AND END OF THE YEAR, WITH THE PURCHASES, SALES, PRODUCTION AND CONSUMPTION OF THE INTERIM.

| ITEM. | On hand Nov. 1, 1880. | | Bought during the year. | | Produced or increased in value. | | | Consumed or decreased in value. | | Sold during the year. | | On hand Oct. 31, 1881. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number or amount. | Value. | Number or amount. | Value. | Acres. | Number or amount. | Value. | Number or amount. | Value. | Number or amount. | Value. | Number or amount. | Value. |
| Horses | 10 | $885 00 | 1 | $125 00 | ..... | ..... | $125 00 | ..... | $155 00 | 1 | $25 00 | 10 | $955 00 |
| Hogs | 49 | 374 00 | 1 | 12 10 | ..... | ..... | 245 79 | ..... | ..... | 50 | 631 00 | ..... | ..... |
| Cattle | 47 | 2,416 50 | 15 | 718 75 | ..... | 17 | 613 74 | ..... | 75 05 | 29 | 721 94 | 50 | 2,952 00 |
| Implements | ..... | 2,027 40 | ..... | 180 27 | ..... | ..... | ..... | ..... | 41 67 | ..... | ..... | ..... | 2,166 00 |
| Corn | 2,000 bus. | 700 00 | ..... | ..... | 27 | 1,600 bus. | 800 00 | 2,121½ bus. | 769 89 | 78½ bus. | 30 11 | 1400 bus. | 700 00 |
| Wheat | ..... | ..... | 528½ bus. | 727 62 | 36 | 677 " | 1,068 28 | ..... | ..... | 1,122 " | 1,670 65 | (1) 83½ " | 125 25 |
| Oats | 57 bus. | 17 10 | ..... | ..... | 2 | 40 " | 20 00 | 57 bus. | 17 10 | ..... | ..... | 40 " | 20 00 |
| Rye | 16¼ " | 10 72 | ..... | ..... | 4 | 77 " | 69 30 | ..... | ..... | 71¾ bus. | 64 67 | (1) 21½ " | 15 35 |
| Beets | 2,000 " | 150 00 | ..... | ..... | 3 | 1,500 " | 150 00 | 2,000 bus. | 150 00 | ..... | ..... | 1500 " | 150 00 |
| Hay | 52 tons. | 520 00 | 13¾ tons. | 109 60 | 50 | 90 tons. | 900 00 | 60½ tons. | 568 85 | 5¼ tons. | 60 75 | 90 tons. | 900 00 |
| Corn-fodder | 950 shks. | 190 00 | ..... | ..... | ..... | 560 shks. | 112 00 | 950 shks. | 190 00 | ..... | ..... | 560 shks. | 112 00 |
| Straw | 50 tons. | 175 00 | ..... | ..... | ..... | 30 tons. | 100 00 | 23 tons. | 38 22 | 27 tons. | 136 78 | 30 tons. | 100 00 |
| Feed | ..... | ..... | ..... | 258 79 | ..... | ..... | ..... | ..... | 258 79 | ..... | ..... | ..... | ..... |
| Milk | ..... | ..... | ..... | ..... | ..... | 9,600 gals | 2,276 66 | ..... | ..... | 9,600 gals. | 2,276 66 | ..... | ..... |
| Sorghum | 216¾ gals. | 90 77 | ..... | ..... | 3 | 226¼ " | 107 39 | ..... | ..... | 443 " | 198 16 | ..... | ..... |
| Garden produce and fruit | ..... | 10 00 | ..... | ..... | 10 | ..... | 717 29 | ..... | ..... | ..... | 717 29 | ..... | 10 00 |
| Clover seed | ..... | ..... | ..... | ..... | ..... | 31½ bus. | 141 50 | ..... | ..... | 25½ bus. | 114 50 | 6 bus. | 27 00 |
| Miscellaneous produce | ..... | 65 20 | ..... | 154 83 | 2 | ..... | 189 16 | ..... | ..... | ..... | 383 19 | ..... | 26 00 |
| Expense | ..... | ..... | ..... | 842 91 | ..... | ..... | ..... | ..... | 842 91 | ..... | ..... | ..... | ..... |
| Crops of next year | ..... | 393 67 | ..... | ..... | ..... | ..... | ..... | ..... | 393 67 | ..... | ..... | ..... | ..... |
| Labor and superintendance | ..... | ..... | ..... | 4,443 36 | ..... | ..... | (2) 234 55 | ..... | 3,443 58 | ..... | 241 11 | ..... | (3) 259 31 |
| Experimentation | ..... | ..... | Material | 30 18 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (4) 350 00 |
| Permanent improvements | ..... | ..... | " ... | 489 98 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | (4) 904 07 |
| Totals | ..... | $8,025 36 | ..... | 8,093 39 | 137 | ..... | $7,870 66 | ..... | $6,944 73 | ..... | $7,272 70 | ..... | $9,771 98 |

(1) Seed of the crop of 1882.
(2) Value of labor of farm teams included in "labor sold," in "improvement," in "experimentation" and in "value of crops of 1882."
(3) Expended in crops of 1882. The total amount of this expenditure is as follows:

| | |
|---|---|
| 83½ bushels seed wheat | $125 25 |
| 21½ bushels seed rye | 15 35 |
| Labor of plowing, manuring, and sowing | 259 31 |
| Total | $399 91 |

(4) Material and labor.

It will be seen from the foregoing statement that the cash receipts during the year have been $7,272.70; if we deduct from this sum the expenditures for live stock, seeds, feed and miscellaneous produce and for labor re-sold, we shall have $4,824.90 as representing the sales of productions of the farm during the year. This sum was realized from the produce of 212 acres of land, there having been 65 acres in pasturage in addition to the 137 acres of crops enumerated above, an average gross return of $22.75 per acre.

The excess of the total value of the productions of the farm for the year, as shown in the third column of this statement, over the total value of produce consumed, as shown in the fourth column, is $925.93, which sum represents the net earnings of the farm for the year. The same balance is found by the following statement, which is based upon the inventories for the beginning and end of the year, together with the cash received from other sources than the year's productions, and expended for other purposes than the legitimate expenses of crop production:

STATEMENT "B."

FARM DEPARTMENT, OHIO STATE UNIVERSITY.

*Dr.*

| | | | |
|---|---|---|---|
| To | inventory of November 1, 1880 | $8,025 36 | |
| | cash on hand " " | 39 67 | |
| | cash furnished by "Farm Committee" | 850 00 | |
| | balance found as profit | 925 93 | |
| | | | $9,840 96 |

*Cr.*

| | | | |
|---|---|---|---|
| By | inventory of October 31, 1881 | $8,517 91 | |
| | cost of improvements made | 904 07 | |
| | cost of experimental work | 350 00 | |
| | cash on hand October 31, 1881 | 68 98 | |
| | | | $9,840 96 |

The balance above found has been expended as follows:

| | | | |
|---|---|---|---|
| In | construction of permanent improvements (in excess of appropriation) | $54 07 | |
| | experimental work | 350 00 | |
| | increase of inventory (less cash on hand Nov. 1, 1879) | 452 88 | |
| | cash on hand | 68 98 | |
| | | | $925 93 |

THE DAIRY.

Our sales of milk and butter amounted to $2,289.59 this year, against $1,890.64 last year, and $957.33 the previous year. The care of the cows and the marketing of the milk has been entirely in the hands of students. The financial results of the dairy operations are shown by

STATEMENT "C."

DAIRY DEPARTMENT, OHIO STATE UNIVERSITY.

*Dr.*

| | | |
|---|---|---|
| To cost of milking and care, including use of horse in delivering | $894 37 | |
| cash expense and repairs | 116 39 | |
| cost of maintaining inventory | 121 00 | |
| keeping 28 cows for 12 months, to balance | 1,441 83 | |
| Total | | $2,573 59 |

*Cr.*

| | | |
|---|---|---|
| By total sales of milk | $2,276 66 | |
| " butter | 12 93 | |
| growth and sales of 19 calves | 116 00 | |
| manure from 28 cows, @ $6 | 168 00 | |
| Total | | $2,573 59 |

The above balance gives $51.49 to pay for the feed consumed by each cow, after paying for all cost of care.

THE ORCHARD AND GARDEN.

Produce to the amount of $717.29 has been sold from these departments, $140.00 of which was realized from strawberries. The return from vegetables would have been much larger but for the drouth. Labor is charged to these departments to the amount of $464.50, much of which was spent in the way of investments to be realized upon hereafter.

CASH ACCOUNT.

The disposition of the funds which have passed through my hands during the year, is shown by

STATEMENT "D."

C. E. THORNE, *Manager, in account with Farm Department, Ohio State University.*

*Dr.*

| | | |
|---|---|---|
| To cash on hand November 1, 1880 | $39 67 | |
| " received from Farm Committee | 850 00 | |
| " " sales of produce, etc | 7,272 70 | |
| Total cash receipts | | $8,162 37 |

*Cr.*

| | | |
|---|---|---|
| By expenditures for ordinary labor | $2,008 74 | |
| " student labor | 1,734 62 | |
| salary of Superintendent for 11 months | 700 00 | |
| Total expenditure for labor and superintendence | | $4,443 36 |

| | | |
|---|---|---|
| By cash paid for increase of inventory | $1,036 12 | |
| " improvement material | 489 98 | |
| " experiment material | 30 18 | |
| " material re-sold and current expense | 2,093 75 | |
| cash on hand | 68 98 | $3,719 01 |
| Total cash expenditures | | $8,162 37 |

IMPROVEMENTS.

The permanent improvements made upon the farm during the year, have been as follows:

(1.) The dikes on our river frontage have been repaired and strengthened, and a second culvert of eighteen-inch sewer pipe has been placed in the dike at the mouth of the old "cut-off," in order to facilitate the egress of water during heavy rains.

(2.) Several of the fields have been partially cleared of stones and useless trees, and the cleared portions of the "island" have been enlarged by taking the trees and brush out of the swale, in order to fill it with the plow and fit the whole for cultivation and pasturage. From the cost of this improvement (given below) the value of the wood obtained has been deducted.

(3.) The eastern part of field No. 3 (now assigned to the Horticultural department for gardening purposes), has been almost thorough-drained by the construction of eight lateral drains connecting with the main drains which had previously been made through the field, and the northeastern corner of field No. 6 (north of the College building), was drained by making a four-inch main across it, with six lateral drains about fifty feet apart.

(4.) A portion of the barn-yard has been paved with limestone, a work rendered necessary on account of its low situation.

(5.) The fence on our north frontage has been completed, and portions of the fences nearest the farm buildings have been whitewashed.

(6.) A row of shade-trees has been set along Woodward avenue, and the vacancies along High street and in the orchard have been filled. The drouth, however, has nullified much of this work.

(7.) A rip-rap has been partly built against the bank of the brook in front of the farm-house.

(8.) A well, ten feet deep, was dug at the foot of the bluff, near the farm-house, in order to get water for the hot-beds, and in the hope that the water would be fit for drinking—a hope which was disappointed. The stock well in the northeast field was also made deeper.

(9.) A roadway was made across the north side of field No. 5, in order to facilitate the moving of stock to and from the front pasture-lot.

The cost of these improvements is itemized below.

STATEMENT "E."

ITEMIZED COST OF FARM IMPROVEMENTS.

| For what purpose. | Value of labor. | Cost of material. | Total cost. |
|---|---|---|---|
| 1. Protecting river frontage | $84 78 | $18 00 | $102 78 |
| 2. Clearing | 80 31 | ..... | 80 31 |
| 3. Draining (235 rods) | 95 59 | 104 58 | 200 17 |
| 4. Paving barn-yard | 61 00 | 25 42 | 86 42 |
| 5. Building and whitewashing fences | 18 51 | 87 92 | 106 43 |
| 6. Planting trees | 24 74 | 16 27 | 41 01 |
| 7. Building rip-rap | 15 85 | ..... | 15 85 |
| 8. Digging wells | 15 61 | 11 00 | 26 61 |
| 9. Making roads | 17 70 | ..... | 17 70 |
| Totals | $414 09 | $263 19 | $677 28 |

In addition to the above total, the sum of $226.79 has been paid for material used in improvements made during the previous year, making the total expenditure for these purposes during this year, $904.07.

## FARM EXPERIMENTS.

It is impossible to state the exact cost of the experiments made upon the farm during the year. The division between the labor necessary to the care of a crop, and the additional work required to contrast the results of different processes, is sometimes very difficult to arrive at; while a very large portion of my time, as Superintendent, if not directly occupied in the direct care of experimental work, has been taken up with preparing the farm for future work of this kind. The only true way would seem to be, especially upon this farm, which is valued at several times its utmost agricultural value, to charge all its expenses to the account of experimentation, and to credit that account with produce sold. According to my previous custom, however, I have charged this account with material to the amount of $30.18 which was consumed directly in the conduct of experimental work, and with labor and superintendence to the amount of 319.82; total, $350.00.

These experiments were made under the direction of Dr. N. S. Townshend, Professor of Agriculture, and the following is a transcript of the report made to him of their results:

### AN EXPERIMENT IN COW FEEDING.

The following experiment was made during the past winter, for the purpose of inquiring into the effect upon cattle foods of slight fermentation. It is a very commonly received opinion among feeders of live stock that food digests more fully

and therefore gives a better return, when slightly fermented before feeding, than when fed entirely fresh; and it seems reasonable that this should be the case, since one of the known effects of such fermentation is the starting of the process by which starch is converted into sugar, which is likewise one of the first steps in the digestive process.

The recent agitation of the ensilage question has added a new interest to this subject, since one of the advantages claimed for that method of preserving food is that the partial fermentation which occurs in the silo starts the breaking down of the starchy combinations and renders them more easy of assimilation by the animal organism.

About the middle of January four cows were selected from the herd belonging to the farm as being, all things considered, the best adapted to the purposes of this experiment, and treated as follows:

1. Two cows, pair "A," were given, for a period of two weeks, a daily meal-ration consisting of six pounds to each cow of corn-meal and wheat "shorts" in equal parts by weight, the mixture being wet with warm water and allowed to stand in a cellar until fermentation had commenced, and then being fed morning and evening, making three pounds at each feed.

2. Two cows, pair "B," were fed during the same period with a dry mixture of the same quantity of meal and shorts.

3. All the cows had good timothy hay, *ad libitum*, but the quantity actually consumed was ascertained by weighing each feed given, and weighing back the residue in the mangers at the end of each week.

4. At the end of this period of two weeks the conditions of feeding were reversed, pair "A" being fed on dry meal and pair "B" on fermented meal, and this change was repeated at the end of every period of two weeks for ten weeks from the beginning of the experiment. The following is a description of the cows used in this experiment, the weights given being those at the commencement:

| Number. | Kind of Stock. | Weight —lbs. | Calved. | Due to calve. |
|---|---|---|---|---|
| 1 | Common Stock..... | 977 | Dec. 1880..... | Farrow. |
| 2 | Grade Short Horn..... | 992 | " ..... | Nov. 1881. |
| 3 | " " " ..... | 1180 | Sept. 1880..... | July 1881. |
| 4 | " " " ..... | 1149 | " ..... | Farrow. |

In Table I. are given the average daily live weights, the number of pounds of hay eaten, and of milk given by each cow during each week of the experiment, and the mean temperature for each week as taken by the Signal Service at the Columbus station.

In Table II. the results are grouped in such a manner as to show the average daily live weight of each cow for each period of two weeks; the weekly gain or loss in live weight, (found by taking the difference between the average weights for the last three days of the period and of the corresponding days of the preceding period;) the average weekly consumption of hay; the average weekly yield of milk, and the average weekly increase or shrinkage in yield, determined in the same manner as the gain or loss in live weight.

The averages of these results for all the periods of each method of feeding are collected in Table III.

TABLE I.

| Period. | Week ending | Pair "A." | | | | | | | Pair "B." | | | | | | | Mean temperature. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Condition of food. | Cow No. 1. | | | Cow No. 2. | | | Condition of food. | Cow No. 3. | | | Cow No. 4. | | | |
| | | | Average daily weight. | Lbs. hay eaten per week. | Lbs. milk given per week. | Average daily weight. | Lbs. hay eaten per week. | Lbs. milk given per week. | | Average daily weight. | Lbs. hay eaten per week. | Lbs. milk given per week. | Average daily weight. | Lbs. hay eaten per week. | Lbs. milk given per week. | |
| 1 | January 23 | Fermented. | 987 | 115 | 156 | 999 | 119 | 169 | Dry. | 1191 | 163 | 111 | 1146 | 168 | 130 | 30 |
| | " 30 | | 1003 | 123 | 158 | 1015 | 130 | 166 | | 1209 | 159 | 107 | 1138 | 162 | 125 | 23 |
| 2 | February 6 | Dry. | 1002 | 128 | 154 | 1004 | 133 | 156 | Fermented. | 1221 | 167 | 96 | 1140 | 167 | 124 | 15 |
| | " 13 | | 1012 | 127 | 158 | 1008 | 143 | 159 | | 1226 | 175 | 100 | 1144 | 173 | 126 | 40 |
| 3 | February 20 | Fermented. | 1012 | 105 | 152 | 1022 | 138 | 161 | Dry. | 1222 | 171 | 95 | 1139 | 170 | 124 | 28 |
| | " 27 | | 1000 | 111 | 146 | 1027 | 130 | 155 | | 1227 | 169 | 87 | 1136 | 157 | 116 | 33 |
| 4 | March 6 | Dry. | 1000 | 112 | 135 | 1027 | 151 | 143 | Fermented. | 1235 | 169 | 79 | 1147 | 169 | 110 | 29 |
| | " 13 | | 988 | 98 | 129 | 1029 | 150 | 144 | | 1240 | 166 | 74 | 1148 | 166 | 116 | 40 |
| 5 | March 20 | Fermented. | 972 | 111 | 122 | 1034 | 151 | 143 | Dry. | 1243 | 147 | 75 | 1142 | 163 | 113 | 43 |
| | " 27 | | 976 | 122 | 118 | 1037 | 156 | 147 | | 1244 | 165 | 71 | 1145 | 151 | 109 | 36 |

TABLE II.

| Number of cow. | Dry Meal. | | | | | | Fermented Meal. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of period. | Average daily weight. | Gain* or loss† in weight per week. | Lbs. hay eaten per week. | Lbs. milk given per week. | Gain* or loss† in milk yield per week. | Number of period. | Average daily weight. | Gain* or loss† in weight per week. | Lbs. hay eaten per week. | Lbs. milk given per week. | Gain* or loss† in milk yield p. r week. |
| | | | | | | | 1 | 995 | *15.5 | 119 | 157 | *5.25 |
| 1 | 2 | 1007 | *2.0 | 127 | 156 | †1.75 | 3 | 1006 | †7.5 | 108 | 149 | †17.50 |
| | 4 | 994 | †5.5 | 105 | 132 | †19.25 | 5 | 974 | *1.5 | 116 | 120 | †8.75 |
| | | | | | | | 1 | 1007 | *16.5 | 125 | 167 | †1.75 |
| 2 | 2 | 1006 | †12.5 | 138 | 157 | †7.00 | 3 | 1024 | *11.5 | 134 | 158 | †7.00 |
| | 4 | 1028 | *3.0 | 150 | 143 | †5.25 | 5 | 1035 | *9.0 | 153 | 140 | †10.50 |
| | 1 | 1200 | *20.0 | 163 | 109 | 0 | 2 | 1223 | *1.0 | 171 | 98 | †1.75 |
| 3 | 3 | 1224 | *8.5 | 170 | 91 | †17.50 | 4 | 1237 | †1.0 | 167 | 77 | †12.25 |
| | 5 | 1243 | *5.5 | 156 | 73 | †3.50 | | | | | | |
| | 1 | 1142 | †2.0 | 165 | 128 | †12.25 | 2 | 1142 | †5.0 | 170 | 125 | *7.00 |
| 4 | 3 | 1147 | 0 | 163 | 120 | †12.25 | 4 | 1147 | *11.5 | 167 | 113 | *5.25 |
| | 5 | 1143 | †7.0 | 157 | 111 | †12.25 | | | | | | |

TABLE III.

| Number of cow. | Dry Meal. | | | | | Fermented Meal. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Average weight. | Gain* or loss† in weight per week. | Lbs. hay eaten per week. | Lbs. milk given per week. | Gain* or loss† in milk yield per week. | Average weight. | Gain* or loss† in weight per week. | Lbs. hay eaten per week. | Lbs. milk given per week. | Gain* or loss† in milk yield p r week. |
| 1 | 1000 | †1.75 | 116 | 144 | †10.50 | 992 | *3.16 | 114 | 142 | †7.00 |
| 2 | 1017 | †4.75 | 144 | 150 | †6.12 | 1022 | *12.23 | 137 | 155 | †6.50 |
| 3 | 1223 | *11.33 | 163 | 91 | †7.50 | 1230 | 0 | 169 | 88 | †7.00 |
| 4 | 1141 | †3.00 | 162 | 120 | †12.25 | 1097 | *3.25 | 168 | 119 | †6.12 |
| All. | 1095 | *0.61 | 146 | 126 | †8.97 | 1067 | *4.68 | 147 | 126 | †6.65 |

From this table we perceive that during the periods of dry feeding the four cows gained, on an average, about two-thirds of a pound each in live weight, and that their milk yield decreased at the same time at the rate of nearly nine pounds each per week; while during the periods when the meal mixture was fermented the average gain in live weight was at the rate of four pounds and two-thirds each per week, and the decrease in milk yield at the rate of six pounds and two-thirds each, making a weekly difference of four pounds per head in live weight and two and one-third pounds in yield of milk in favor of fermented food.

We observe a wide difference in the apparent effect upon the individual cows, of the different methods of feeding. For example, cow No. 3 shows a large gain in live weight during the periods of dry feeding—when all the other cows lost flesh, but no gain during the periods when the food was fermented—when all the other cows gained considerably.

By reference to Table II it will be seen that this cow made large gains during the first and third periods, with a very small gain during the second period, while she lost in weight during the fourth period. The low temperature of the first week of the second period apparently served to check the increase of live weight of all the cows, and this *may* have been the cause of an apparent advantage in the dry food for this cow. The general average is not affected by this case, since it is fully counterbalanced by the effect upon cow No. 2, as shown in the same table; No. 2 having dry food during the periods when No. 3 had fermented food, and *vice versa*. This explanation will not account for the loss in weight of No. 3 during the fourth period, and we cannot safely assert that her variation in live weight is not chiefly due to the well-known tendency of animals to fatten irregularly, taking on a large increase during short periods, but making little increase, or even losing in weight, during intermediate periods. All we can say is that in the case of this experiment the *average* results—whether these results be due to the methods of feeding, to the varying influences of the weather upon different organisms, or to other constitutional peculiarities of the different cows—are in favor of fermenting the food, and suggest that a more decided advantage might be obtained by fermenting the whole body of the food—hay, as well as grain. The changes from one method of feeding to the other, while necessary for the elimination of errors arising from constitutional peculiarities of the different animals, and from the effects of changes of weather, have the disadvantage of interfering with a long continued observation upon each separate process.

To show more clearly the idiosyncrasies of the different cows used in this experiment, I append a fourth table, which gives the average live weight of each cow during the whole ten weeks of the experiment; the total yield of milk for the same time; the total gain or loss in live weight, as shown by the difference in the average weights of the first and last three days; the total decrease in the weekly flow of milk, taken in the same manner; the total consumption of hay and meal, and the cost of each hundred pounds of milk produced, hay being valued at seventeen dollars per ton, bran or shorts at fourteen dollars, and corn meal at twenty dollars, and the gain or loss in live weight at four cents per pound.

TABLE IV.

| No. of cow. | Average weight. | Total yield of milk. | Total gain * or loss † in live weight. | Total shrinkage in milk yield per week. | Total amount of hay consumed. | Total amount of meal consumed. | Cost of milk per 100 pounds. |
|---|---|---|---|---|---|---|---|
| 1..... | 995 | 1428 | *12 | 38 | 1152 | 420 | $0 96 |
| 2..... | 1024 | 1543 | *55 | 31 | 1401 | 420 | 0 86 |
| 3..... | 1226 | 895 | *69 | 36 | 1651 | 420 | 1 66 |
| 4..... | 1142 | 1193 | †5 | 24 | 1646 | 420 | 1 49 |

## VARIETIES OF WHEAT.

Thirty-three varieties of wheat were sown in the fall of 1880, upon a piece of bottom land selected for its apparently uniform quality. The previous crop was timothy, and the field was plowed in September. On account of the excessive drouth, sowing was delayed until October 4th to 6th, but even then the seed lay in the ground until much of it had malted before there came rain enough to start it into vigorous growth. On this account the experiment may not be as reliable as could be wished with regard to the comparative productiveness of the different varieties, although it is believed that all the varieties were equally exposed to the unfavorable conditions. Other questions, as comparative weight of grain, quality of grain and straw, etc., of course are not affected. One of the varieties, the "Centennial Black Bearded," proved a total failure, not being adapted to the climate.

After harvest samples of each variety were sent to Warder & Barnett, merchant millers, of Springfield, Ohio, with the request that they test the same with reference to their value for milling purposes. This they have kindly done, and their report is given in the accompanying table, together with the agricultural results of the experiment.

| | Name of Variety. | Date of ripening. | Yield per acre. | | Lbs. straw to 1 bu. wheat. | Weight of grain per bushel. | Smooth or bearded. | Character of grain. | | | Character of straw. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Grain—bush. | Straw—lbs. | | | | Color. | Size. | Milling quality. | Height. | Stiffness. |
| | | | | | | | | | | | ft. | |
| 1 | Siberian | July 12 | 14.69 | 2655 | 180 | 57 | S | A | s | Poor and weak. | 3¾ | Good. |
| 2 | Heige's Prolific | " 2 | 19.38 | *775 | 40 | 61½ | S | A | s | Pretty good. | 3¼ | Good. |
| 3 | Mammoth Red | " 7 | 12.47 | 1967 | 157 | 57½ | S | A | l | " " | 3¾ | Good. |
| 4 | York White Chaff | " 7 | 25.83 | 3197 | 123 | 59 | S | W | l | " " | 3½ | Good. |
| 5 | Rickenbrode | " 5 | 19.68 | 3139 | 159 | 58½ | S | W | m | Good and strong. | 3½ | Good. |
| 6 | Champion Amber | " 6 | 22.93 | 3212 | 140 | 57½ | S | A | m | Poor and weak. | 3½ | Good. |
| 7 | McGhee's Red | " 6 | 21.15 | 3188 | 141 | 62 | S | A | l | Good. | 3¼ | Poor. |
| 8 | Grecian | " 8 | 20.01 | 2577 | 129 | 58½ | S | W | s | Weak. | 3½ | Medium |
| 9 | Arnold's Gold Medal | " 7 | 19.41 | 2185 | 112 | 60 | S | W | m | Weak. | 3¼ | Good. |
| 10 | German Amber | " 2 | 24.67 | 2621 | 106 | 62½ | B | A | l | Good. | 3½ | Poor. |
| 11 | Red Amber | " 7 | 25.88 | 2890 | 108 | 61 | B | A | l | Good. | 3½ | Poor. |
| 12 | Sandomirka | " 5 | 26.85 | 3048 | 113 | 63 | S | W | s | Good. | 3¾ | Good. |
| 13 | Silver Chaff | " 7 | 26.01 | 3024 | 116 | 59½ | S | W | m | Moderately good. | 3¾ | Good. |
| 14 | Clawson | " 6 | 23.39 | 2760 | 118 | 59 | S | W | m | Poor. | 3½ | Medium |
| 15 | Fultz | " 2 | 21.40 | 2704 | 126 | 61 | S | R | m | Poor. | 3½ | Good. |
| 16 | Velvet Chaff | " 2 | 22.83 | 2411 | 102 | 64 | B | A | m | Good and strong. | 3½ | Good. |
| 17 | Egyptian | " 5 | 22.21 | 2697 | 117 | 59 | B | A | m | Tolerably good. | 3½ | Good. |
| 18 | Michigan Amber | " 6 | 21.80 | 2727 | 125 | 59½ | B | A | l | Little gluten. | 3½ | Medium |
| 19 | Yellow Missouri | " 12 | 12.16 | 2967 | 243 | 57½ | S | A | s | Poor. | 3¾ | Good. |
| 20 | Lancaster | " 3 | 23.73 | 2660 | 112 | 59 | B | A | l | Choice and strong. | 3¼ | Poor. |
| 21 | American White | " 7 | 19.30 | 2444 | 126 | 59½ | B | W | l | Pretty strong. | 3½ | Good. |
| 22 | Mediterranean | " 4 | 21.74 | 2249 | 103 | 59 | B | A | l | Good and strong. | 3½ | Poor. |
| 23 | Smith's Improved | " 7 | 16.97 | 2490 | 147 | 59½ | B | W | m | Pretty good. | 3½ | Medium |
| 24 | Hungar'n White Chaff | " 2 | 21.30 | 2942 | 96 | 62 | B | R | | Good. | 3¼ | Medium |
| 25 | Treadwell | " 7 | 19.62 | 2432 | 124 | 59 | B | W | l | Good. | 3½ | Good. |
| 26 | Tappahannock | " 2 | 16.52 | 2173 | 131 | 61 | S | W | s | Choice, tol'y strong | 3 | Good. |
| 27 | Russian No. 2 | " 2 | 17.03 | 1104 | 64 | 62½ | S | W | s | Very good. | 2¾ | Good. |
| 28 | Scott | " 3 | 26.72 | 2111 | 78 | 61½ | B | R | l | Tolerably good. | 3¼ | Poor. |
| 29 | Swamp | " 3 | 23.91 | 2215 | 92 | 61 | B | R | l | " " | 3¼ | Poor. |
| 30 | Zimmerman | " 2 | 26.38 | 2261 | 86 | 61 | S | R | l | Very good. | 3¼ | Good. |
| 31 | Theiss | " 5 | 25.20 | 2318 | 92 | 62½ | B | R | s | Tolerably good. | 3¼ | Poor. |
| 32 | Golden Straw | " 2 | 19.93 | 2592 | 129 | 60½ | S | W | m | Good. | 3¼ | Good. |
| | Averages | | 21.28 | 2488 | 117 | 60⅙ | | | | | | |

Explanations—A, Amber; R, Red; W, White; B, Bearded; S, Smooth; s, small; m, medium; l, large.

*Note.—The extremely small proportion of straw to grain in Heige's Prolific may seem improbable, but a still smaller proportion is reported in the tests of the Missouri Agricultural College for 1880.

The average yield and weight of grain of the varieties ripening on successive days is as follows:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| July 2 | Average yield, | 21.05 | bushels; | weight of grain, | $61\frac{3}{4}$ | pounds. |
| " 3–4 | " | " | 24.02 | " | " | " | $60\frac{1}{8}$ | " |
| " 5 | " | " | 23.48 | " | " | " | $60\frac{3}{4}$ | " |
| " 6 | " | " | 22.29 | " | " | " | $59\frac{1}{2}$ | " |
| " 7 | " | " | 20.68 | " | " | " | $59\frac{1}{2}$ | " |
| " 8–12 | " | " | 15.62 | " | " | " | $57\frac{1}{2}$ | " |

The average yield and weight of grain of the Red and Amber, as compared with the white wheats, is as follows:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Red and Amber, | average yield, | 21.61 | bushels; | weight of grain, | $60\frac{1}{8}$ | pounds. |
| White, | " | " | 20.80 | " | " | " | 60 | " |

The average yield and weight of grain of the smooth wheats, as compared with the bearded wheats, is as follows:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Smooth, | average yield, | 20.28 | bushels; | weight of grain, | $59\frac{3}{4}$ | pounds. |
| Bearded, | " | " | 22.56 | " | " | " | $60\frac{3}{4}$ | " |

In regard to the last two points, Warder & Barnett write as follows: "White wheats are not usually as hardy as red, and smooth not near so hardy as beardy. In an experience of thirty-six years we have never known a smooth wheat which would stand more than three crops." Our figures point toward the same conclusions, and it would seem worth while to examine this matter further.

### A COMPARISON OF GRASSES.

In the spring of 1880 samples of four varieties of grass, viz.: Orchard grass, "English blue grass" (Randall grass of Virginia), Perennial Rye grass and Meadow fescue, were sown upon a plot of bottom land, the object being (1) to test the comparative values of these grasses for agricultural purposes, and, (2) to ascertain and establish the true botanic name of the "English blue grass," it being called *Lolium perenne* by some, and *Festuca pratensis* by others. This point was settled by Professor A. P. Morgan, who decided that the English blue grass was, botanically, *Festuca elatior*, (Gray;) the meadow fescue being *Festuca elatior*, var. *pratensis*. It is evident to an ordinary observer that the English blue grass is a Festuca rather than a Lolium, but the difference between the two fescues is not so striking. It consists, agriculturally, in a larger habit of growth, and slightly later date of blooming for the *F. elatior*. On account of its more vigorous growth it is decidedly preferable to the meadow fescue proper as a meadow grass, while either of them seems, in our case, to be far ahead of the Perennial Rye grass. In comparison with Orchard grass the English blue grass seems to afford an equally good aftermath, while its tendency to form a more compact sod will probably compensate, to a large extent, for its smaller habit of growth. It blooms about a week later than Orchard grass.

### VARIETIES OF STRAWBERRIES.

One thousand plants, each of Forest Rose, Captain Jack, Crescent Seedling, Wilson and Downing strawberries, were set on a gravelly soil during the spring of 1880.

They had, as far as possible, equal opportunities and equal care, and at picking-time this year there was no very strongly marked difference between the yield of either of the four last named varieties, the advantage being somewhat in favor of the Wilson and Crescent Seedling. The Forest Rose, however, failed to grow well last summer, and failed to bear well this, although, what berries were produced, were much larger than those of either of the other varieties.

### VARIETIES OF SORGHUM.

Several varieties of sorghum were planted in the spring, but bad seed and the drouth so interfered with their growth, that no very satisfactory tests as to relative productiveness could be made. The Orange varieties, however, especially the Kansas Orange, seemed to be decidedly superior to the Early Amber for our soil and latitude—a repetition of last season's experience.

### VARIETIES OF CORN.

The "Leaming" and "Porter" varieties of yellow corn have again given excellent satisfaction, the former yielding about seventy bushels per acre, notwithstanding the excessive drouth. Several other varieties of corn were planted, but the same causes which affected the sorghum, have prevented the making of satisfactory comparisons.

Several other experiments were instituted during the season, but their results are either not yet ascertained, or have been obscured by the drouth.

### THE POTATO BUG EXTERMINATOR.

donated to the farm last season, by Mr. H. S. Fox, of St. Louis, Mo., has been used with the greatest satisfaction in fighting the potato bugs, one man doing more work with this apparatus than several could by the old-fashioned methods.

As this report closes my connection with the Ohio State University, I wish to express to the Board of Trustees my thanks for the courteous treatment I have received at their hands. I also desire to express my obligations to the foreman of the farm, George Bell, for the faithfulness with which he has co-operated with me in conducting the work of the farm, both ordinary and experimental.

The foregoing is respectfully submitted.

C. E. THORNE,
*Farm Manager.*

# RECORD OF PROCEEDINGS

## OF THE BOARD OF TRUSTEES OF OHIO STATE UNIVERSITY.

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COLUMBUS, OHIO, *November* 18, 1880.

The Board met at 8 o'clock P. M.

Present—Messrs. Miller, Johnston, Godfrey, Alston Ellis and S. H. Ellis.

The minutes of the previous meeting were read and approved.

The Secretary presented the annual report of the Board, and the same was approved.

Letters from Messrs. Sabin and Mariott were read and ordered filed, after which recess was taken until 8 o'clock A. M., November 19.

On reassembling, the Board took into consideration the claim of Prof. Mathew, for the use of his drawing materials during the six years of his connection with the University, and instructed the Secretary to settle the same on the basis proposed by said Mathew, allowing him $44.00 besides amount due from house rent, and for some unused lithographic material and implements.

The Finance Committee made report that they had carefully examined the accounts of the Treasurer, comparing the warrants paid by the Treasurer and his statement of receipts, with the stubs on the warrant-book of the Secretary, and the receipts in his cash-book, and had found the accounts to be strictly correct, and had so certified.

The Executive Committee made a report of their proceedings since the last meeting of the Board.

Captain C. A. Barton, agent for the sale of Virginia Military Lands, made a report of his agency since June, 1880, whereupon the Board ordered the payment of his salary, $300, and expenses, $110.19, to November 1, 1880, and the report and account to be filed.

On motion of Mr. A. Ellis,

*Resolved*, That Captain C. A. Barton, agent of this Board, in the matter of the Virginia Military Lands, be instructed to have such lands belonging to the University, as can not be sold at the present appraised value, reappraised, with a view to their more speedy sale.

The Secretary reported the completion of the Virginia Military

Land Register, ordered by the Board at their meeting April 20, 1880. The same was ordered to be kept for reference and further entry.

On motion of Mr. A. Ellis,

*Ordered*, That the income of the Endowment Fund (so called), held in trust by the State, and all income from whatever source not otherwise specifically directed, be, and is hereby appropriated for the maintenance and support of the University for the ensuing fiscal year, and for such other purposes incident thereto as the Board of Trustees may, from time to time, determine; provided, that the use of the income ($20,547) of so much of the fund ($342,450.81), as was derived from the proceeds of the land scrip donated by act of Congress July 2, 1862, be limited to the restriction of the second clause of section 5 of said act of Congress.

The reports of the President of the University and the Professors were then read, and these, with the other reports, referred to the President of the University and Secretary of the Board, to prepare for publication.

On motion, the following appropriations were ordered, viz.:

| | |
|---|---|
| For Department of Physics, (to be expended by Prof. Mendenhall) | $1,000 00 |
| For Department of Zoology and Comparative Anatomy | 400 00 |
| " Chemistry, (Library use) | 100 00 |
| " Latin and Greek, " | 100 00 |
| " Geology | 50 00 |
| For the College Band | 25 00 |

On motion of Mr. S. H. Ellis,

*Resolved*, That the By-Laws of the Board be amended so as to read, "One meeting of the Board shall be held on the *second* Thursday (instead of *third* Thursday), of November," as stated in section 2 of the By-laws.

The following preamble and resolutions were adopted:

WHEREAS, The Board recognizes the practical importance of the subject of Entomology, and the special fitness of Dr. J. M. Wheaton to speak on this subject to the farmers of Ohio; therefore,

*Resolved*, That Dr. J. M. Wheaton be invited to deliver two or more lectures on Entomology in the forthcoming course of Lectures on Agriculture, at the State University.

*Resolved*, That President Orton be requested to correspond in reference to securing a person fitted to take charge of a Horticultural Department in connection with the Department of Agriculture.

The election of officers of the Board was then proceeded with, and resulted as follows, viz.:

For President of the Board, T. Ewing Miller.
For Vice President of the Board, James B. Jamison.
For Treasurer " Henry S. Babbitt.
For Secretary " Albert Allen.

For Executive Committee, J. H. Anderson, Chairman; Alston Ellis and Stephen Johnston.

For Farm Committee, James B. Jamison, Chairman; T. J. Godfrey and S. H. Ellis.

For Finance Committee, Alston Ellis, Chairman; S. H. Ellis and T. J. Godfrey.

*Resolved*, That in case both the non-resident members of the Executive Committee shall be absent at the regular or called meetings of said committee, the Chairman of the committee and President of the Board shall be authorized to transact all business properly belonging to the Executive Committee.

*Resolved*, That the salary of the Secretary shall be ($1,200), twelve hundred dollars per annum, and that in addition to his ordinary clerical duties, as defined in the by-laws of this Board, he shall perform the following duties:

1. Superintend all purchases authorized by the Board, the Executive Committee and the Farm Committee.

2. Supervise all improvements and repairs of buildings.

3. Attend all meetings of the Executive and Farm Committees, and keep a record of the proceedings of the same.

4. Keep an accurate account of all sales of Virginia Military Lands, receive all moneys arising from such sales, and certify the same into the Treasury.

5. Receive all rents and term fees, and certify the same into the Treasury.

6. Keep at his own expense an office at some convenient point where the Board and different committees may meet for the transaction of business.

On motion, it was

*Resolved*, That the bond of the Treasurer be fixed at forty thousand dollars, and that the Secretary file the same as soon as approved by the Attorney-General.

*Ordered*, That the Secretary be instructed to draw an order in favor of the Strobridge Lithographing Company, of Cincinnati, for $110.50, in payment of wood-cut. letter-heads and envelopes as per contract.

*Ordered*, That the Secretary be authorized to order of the Strobridge Lithographing Company 5,000 additional letter-heads at a price not to exceed eight dollars per thousand, and also to make such changes in the names, etc., as may be necessary by reason of the action of the Board.

*Resolved*, That the salary of Assistant Professor, Wm. A. Mason, Jr., be fixed for the second and third terms of college year at the rate of $1,200 per annum. Carried.

The Farm Committee presented their annual report, which, after reading, was referred before publication to the Chairman, Jas. B. Jamison, absent from this meeting.

On motion of Mr. Johnston, the following preambles and resolution were adopted:

WHEREAS, The Farm Manager, C. E. Thorne, on the 17th day of June, 1880, tendered his resignation as Farm Manager; and

WHEREAS, Upon said resignation the Board of Trustees, by a resolution, giving to the Prof. of Agriculture a general supervision in the management of the farm; and

WHEREAS, Said professor, upon the urgent request of the Trustees, refused to assume the duties assigned to him, or to make any suggestions as to the future man-

agement of said farm, thereby compelling the Trustees to obtain the services of a suitable person to fill the vacancy occasioned by the resignation of the said Farm Manager; therefore,

*Resolved*, That the President of this Board be requested to look after some suitable person to fill said vacancy, and to report at the next meeting of the Board.

Board adjourned.

T. EWING MILLER,
*President.*

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COLUMBUS, O., *January* 5 1881.

The Board met at 9 o'clock A. M.

Present—Messrs. Anderson, A. Ellis, S. H. Ellis, Godfrey, Jamison, Johnston and Miller.

The President called the meeting to order. The minutes of the previous meeting were approved. The report of Executive Committee was read and accepted. President Orton, who was appointed to correspond in relation to a suitable person to fill a chair of Horticulture and Botany, reported the names and credentials of the following persons, viz.: Henry E. Owen, Adrian, Michigan; Prof. W. A. Buckhout, State College, Pa.; Prof. W. A. Kellerman, Fairfield county, O.; A. P. Morgan, Dayton, O.; Prof. W. L. Lazenby, Ithaca, N. Y.; Prof. J. C. Arthur, Madison, Wisconsin.

On motion of A. Ellis, it was

1. *Resolved*, That a Department of Horticulture and Botany be established in connection with the Ohio State University, and that for the present the Department be placed under the charge of an Assistant Professor, whose salary shall be $1,500 per annum. Carried.

2. *Resolved*, That the position of Assistant Professor in said department be tendered to ——— ———, and that the Secretary be instructed to notify him of his appointment. Carried.

3. *Resolved*, That the duties of said Professor shall begin with the opening of the spring term. Carried.

An election was then entered into, and A. P. Morgan, of Dayton, Ohio, having been selected, the blank in the second resolution above was ordered to be filled with his name.

On motion of Mr. Jamison, it was

*Resolved*, That the matter of Farm Manager, with the applications for that position, be referred to the Farm Committee, to report during this session of the Board. Carried.

A communication from Attorney-General Nash, to the Board, concerning the suit of Wm. H. Leete against the University, and giving

the terms of a compromise offered by his attorney, M. A. Daugherty, was read and discussed, whereupon Messrs. Miller, Johnston and Anderson were appointed a committee to see the Attorney-General and Mr. Leete's attorney in relation to the matter, and report at 7½ o'clock to-night.

On motion, a recess was taken until 7½ o'clock P. M.

The Board on reassembling gave immediate attention to the report of the committee concerning the Leete suit, which was as follows, viz.:

Your committee recommend that in the matter of the action of Wm. H. Leete, against the Ohio State University, a settlement of the case be made upon the terms proposed by M. A. Daugherty, attorney for said Leete, to wit: the payment by the University of the sum of two thousand two hundred and eighty-four dollars and thirty-three cents.

On motion, the report of the committee was adopted, and the Secretary ordered to draw his warrant on the Treasurer, payable to M. A. Daugherty, for $2,284.33, to be distributed by him according to the schedule on file, said sum to be paid from proceeds of sale of Virginia Military Lands.

*Ordered*, That $15 be allowed Mr. Makepeace for his services as leader of the band.

The Secretary was instructed to write C. A. Barton, agent, to delay any reappraisements of lands in Adams or Pike counties until it was evident they could not be sold at present appraisement, and that while they ratify his action in the one case reported of a contract for the discovery of lands by S. Kendrick, they are not willing at present to extend the terms of the agreement to other cases.

A communication from Mr. Evans, attorney for Wooley & Sons, in regard to their claim of a portion of Survey No. —, Virginia Military Lands, was read and referred to Mr. Johnston to investigate and take such action as he might decide best.

The Farm Committee made report as follows:

The Farm Committee, to whom was referred the matter of Farm Manager, report that we have carefully investigated the subject referred, and unanimously recommend that C. E. Thorne be retained as such manager from April, 1881, to April, 1882, at a salary of nine hundred dollars ($900), and in the event of his non-acceptance the committee be empowered to act in the selection of another person.

The report, after discussion, was adopted.

The term for which Lieutenant Lomia had been detailed by the War Department, as Instructor in Military Science and Tactics in the University expiring in June next, applications and recommendations of the following officers of the United States Infantry were presented, viz.:

First Lieutenant, George Ruhlen, 17th U. S Infantry; Second Lieutenant, A. M. Ogle, 19th U. S. Infantry, and Second Lieutenant, H. S. Heinstand, 11th U. S. Infantry.

Lieutenant George Ruhlen having been elected to the position, the President of the Board was requested to make application to the War Department, asking that he be detailed for this service after June, 1881.

Board adjourned to 8 o'clock A. M. to-morrow.

Board met at 8 o'clock A. M. January 6, 1881.

On motion, it was

*Ordered*, That $100.00 be appropriated to pay the traveling expenses of Dr. Townshend in attending Agricultural Institutes, upon the presentation of his vouchers therefor.

On motion of Mr. Johnston,

*Resolved*, That the Farm Manager be and he is hereby requested to prepare and submit to the Board of Trustees at their next meeting a detailed plan for the future development and improvement of the University farm, so as to adapt the same systematic experimental tests in all the branches of agriculture, and also such improvements as will be calculated to add to the beauty of the farm, not including that portion of the same now under the supervision of Prof. McFarland. The resolution was, by vote, referred to the Farm Committee, to report at some future meeting of the Board.

The following resolution was offered by Mr. Johnston, and adopted, viz.:

*Resolved*, That Prof. A. H. Tuttle be and is hereby requested to prepare and submit a plan for the establishment of a fish hatchery on the University farm, and also to make such recommendations and suggestions as in his judgment may be necessary in order to carry out the plan for fish culture on the farm.

On motion, it was unanimously

1. *Resolved*, That the President and Faculty of the Ohio State University are hereby instructed to arrange for holding daily a general meeting of the students in the University chapel.

2. *Resolved*, That the nature of the exercises and the time of holding the same shall be matters under the control of the Faculty.

On motion, the Board adjourned, subject to the call of the President.

T. EWING MILLER,
*President.*

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COLUMBUS, O., *January* 20, 1881.

A special meeting of Trustees was called to-day. Present, Messrs. S. H. Ellis, Jamison, Johnston and Miller.

President Orton appeared before the Board, and represented the difficulty in executing an order of the Board relating to the daily assembling of the students for chapel services, whereupon Mr. Johnston offered the following:

*Resolved*, That the resolution heretofore passed, requiring a daily assemblage of the students, be suspended for the time being, until otherwise ordered by the Trustees. Adopted.

On motion of Mr. Johnston,

*Resolved*, That the Executive Committee be and are hereby requested to investigate and report the feasibility of introducing the electric light upon the grounds of the Ohio State University, including, if practicable, the substitution of said light for the gas-light now used in the buildings of the University, and that said committee report at the next meeting of the Board. Adopted.

The Board then adjourned.

T. Ewing Miller, *President*.

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Columbus, O., *May* 6, 1881.

Board met at 8 o'clock A. M. Present, Messrs. Anderson, S. H. Ellis, Alston Ellis, Godfrey, Jamison, Johnston and Miller.

Mr. Johnston made verbal report on the use of electric light at the University, deeming it unpracticable at this time. Also, on the claim of Evans & Son to certain military land, concerning which he had fully advised Capt. Barton, the Agent of the Board for these lands.

The Executive Committee made full report of their proceedings since the last meeting of Board. The report was approved.

The minutes of the proceedings of the Farm Committee were read and approved.

*Ordered*, That $500.00 be appropriated for the purchase of chemicals, to be expended by Prof. Norton for the Department.

*Ordered*, That $15.00 be appropriated for the services of Geo. D. Makepeace, as leader of the College Band during the Spring term.

*Ordered*, That $500.00 be and is hereby appropriated for the use of the Farm Committee to pay current expenses.

The resignation of Professor Joseph Millikin, on account of ill-health, was received, and on motion the following resolutions were unanimously adopted:

*Resolved*, That the resignation of Joseph Millikin, as Professor of English Language and Literature, be accepted.

*Resolved*, That in recognition of his eminent scholarship and acceptable services, and in view of the fact that such action has been unanimously recommended by the Faculty of the University, the Degree of Doctor of Philosophy is hereby conferred on Professor Millikin.

A communication was received from Prof. N. W. Lord, in relation to the work done in his department in the analysis of minerals, &c., and asking for privileges and pay therefor; whereupon, the following resolution was adopted:

*Resolved*, That Prof. N. W. Lord, for the next year, be employed at a salary of $1,000, for which sum he is required to take charge of the instructions in the Department in assaying, metallurgy and mining, and to do in the State Laboratory such work as shall be submitted to him by the President of the Faculty and is covered by the State law. That he is to have full use of the Laboratory for other work, and the privilege of employing at his expense such assistance as he may desire in the Laboratory. That he will, at his expense, provide all current supplies, except those furnished students in assaying. No Laboratory or other work is to interfere with class instruction or other duties to the University. That all work so taken and done shall be charged for and collected by him. That he retain so much thereof as will make his net salary for the year, together with said one thousand dollars, two thousand dollars, if so much be collected by him, and that all excess over two thousand dollars shall be by him paid over to the University. That he shall maintain the apparatus of the Department and keep the same in good condition.

Prof. Orton was heard by the Board in relation to readjustment of Class Instruction in several Departments.

A letter was read from Prof. Mendenhall, asking for an appropriation of $500, for purchase of apparatus for Department of Physics.

On motion, it was

*Ordered*, That $500 be and is hereby appropriated for the purchase of apparatus for the Department of Physics, to be expended by Prof. Mendenhall.

The report of Prof. Tuttle on Fish Culture at the University, was read and filed.

A communication from Prof. Smith was read, asking for leave of absence for two years to complete his studies in Germany. The request was declined.

The matter of insuring the Mechanical Laboratory was indefinitely postponed.

On motion of Alston Ellis, the following preamble and resolution were unanimously adopted:

WHEREAS, The term of Hon. Stephen Johnston, as a member of the Board of Trustees of the Ohio State University will soon expire; and whereas, the services of Mr. Johnston as a member and President of the Board have been of such a character

as to redound to the interest of the University, and to meet the hearty approval of his fellow laborers; therefore,

*Resolved*, That the thanks of the Board are hereby tendered to Hon. Stephen Johnston for his zeal in behalf of the State University, and his kind and gentlemanly attitude towards the members of the Board.

On motion, it was

*Resolved*, That the Secretary, in issuing the notice of any called meeting, called under the rules of the Board, shall state fully to each member the object of such called meeting.

A communication from Prof. S. C. Derby to the Board, was read, and, after discussion, the following resolutions were adopted, viz.:

*Resolved;* That the Trustees of Antioch College, of Yellow Springs, Greene county, Ohio, are hereby invited to co-operate with the Trustees of the Ohio State University in the work of higher education, on the following general basis, viz.:

The Trustees of Antioch College shall nominate one or more Professors to such departments of liberal culture in the Ohio State University as shall be agreed upon by the Boards of Trustees of the two Institutions herein named, which departments shall be known as the Antioch College Professorships. The nomination of such Professors shall be submitted to, and approved by, the Trustees of the State University.

The salaries of such Professors shall be paid by the Trustees of Antioch College, but said Professors shall be on terms of entire equality in college administration with the Professors of the State University.

The nominations and approvals of the respective Boards shall be renewed for each collegiate year.

On motion, it was

*Ordered*, That the appropriation of $1,000, made by the General Assembly for "ordinary repairs" for the Ohio State University, be expended under the direction of the Executive Committee, and that the Secretary be and is hereby authorized to draw his warrant on the Auditor of State for the same, whenever the bills or accounts chargeable against this appropriation shall have been endorsed by the Chairman of the Executive Committee.

*Ordered*, That the Secretary be and is hereby authorized to draw his warrant on the Auditor of State, in favor of the Treasurer of the University, for the appropriation of the $350 for "trustee expenses," when the vouchers shall be approved by the President of the Board.

On motion of Mr. A. Ellis, the following preamble and resolution were adopted:

WHEREAS, It is the desire of Dr. Edward Orton to be released from the duties of President of the University; therefore,

*Resolved*, That the President of the Board and the Executive Committee be authorized to correspond with suitable parties with a view to filling such position, and that the result of the correspondence be reported to the Board for action.

On motion, it was

*Resolved*, That Prof. Josiah R. Smith, Prof. John T. Short, and Prof. N. W. Lord be advanced to the full professorial rank.

*Resolved*, That the Secretary of the Board, in notifying the gentlemen of the above action, be instructed to state that said advancement does not carry with it any increase of compensation.

Board adjourned.

T. EWING MILLER, *President.*

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COLUMBUS, OHIO, *June* 21, 1881.

The Board met at 8:30 o'clock A. M.

Present—Messrs. Anderson, S. H. Ellis, Godfrey, Jamison, Miller and L. B. Wing.

The minutes of the previous meeting were read and approved.

The correspondence between the Secretary and Prof. Lazenby of Cornell University, touching his appointment to a chair in the University, were read.

The report of the Executive Committee was presented and approved.

A communication in writing, to the Board, concerning the qualifications of certain persons for the position of President and Professor of Latin and Greek in the University, and a readjustment of some of the studies, was presented and read by President Orton.

The resignation of Prof. Josiah R. Smith was read, and on motion, the same was accepted.

On motion, Prof. S. C. Derby, of Antioch College, Ohio, was unanimously elected Professor of Ancient Languages in the Ohio State University, the vote being by yeas and nays.

Mr. Jamison presented the resignation of C. E. Thorne as Farm Manager, to take effect at some unnamed time. The resignation was referred to the Farm Committee to report upon during the session of the Board.

On motion of Mr. Godfrey, Mr. Wing was elected to fill the vacancy in the Executive Committee, caused by the expiration of the term of Hon. Stephen Johnston.

On motion, the Board proceeded to the election of a President to succeed President Orton, whose resignation had been tendered the Board June 20, 1878.

Prof. Walter Q. Scott, of Easton, Pennsylvania, was nominated. On the call of the ayes and nays, Messrs. Miller, Jamison, Wing, Godfrey and Ellis voted aye, and Mr. Anderson voted nay. The Chair announced Mr. Scott as duly elected President of the Ohio State University and Professor of Philosophy and Political Economy.

Messrs. Wing, Godfrey and Jamison were appointed a Committee to notify Prof. Scott of his election, and ask his presence at the University at two o'clock P. M. to meet the Board.

At two o'clock P. M. the Board met in President's room at the University.

On motion, Lieutenant George Ruhlen was appointed Assistant Professor of Mathematics, to teach two hours each day, at a salary of $500 per annum.

On motion, Miss Belle Swickard was elected Assistant Librarian on a salary of $125 per annum.

*Ordered*, That the following appropriations be and the same are hereby made, viz.:

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| For advertising, general and special | $200 00 |
| " Library, to be distributed | 300 00 |
| " Chemical Laboratory supplies | 300 00 |
| " Assistant in Chemical Laboratory | 150 00 |
| " improvements and material in Mechanical Laboratory | 210 00 |
| " Zoölogical Department supplies | 200 00 |
| " ventilation in Chemical Department, a sum not exceeding | 125 00 |

To be expended under the direction of the Executive Committee.

Repairs to the gas reservoir and house and to the dormitories were also ordered, under the direction of the Executive Committee.

The Board proceeded to the election of officers of the University for next collegiate year, at the salaries named herewith, the full roster being :

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| For President, Walter Q. Scott, salary | $2,750 00 |
| For Prof. of Geology, Edward Orton, salary | 2,250 00 |
| " General and Applied Chemistry, Sidney A. Norton, salary | 2,250 00 |
| " Agriculture, Norton S. Townshend, salary | 2,250 00 |
| " Mathematics and Civil Engineering, R. W. McFarland, salary | 2,250 00 |
| " Zoology and Comparative Anatomy, A. H. Tuttle, salary | 2,250 00 |
| " Mechanics, W. S. Robinson, salary | 2,250 00 |
| " Physics, T. C. Mendenhall, salary | 2,250 00 |
| " Mining and Metallurgy, N. W. Lord (conditional), salary | 2,000 00 |

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| For Prof. of History and English Language and Literature, John T. Short, salary | | 1,800 00 |
| " Botany and Horticulture, W. L. Lazenby, salary | | 2,000 00 |
| " Latin and Greek Languages, S. C. Derby, salary | | 1,600 00 |
| " Military Science and Tactics, and Mathematics, Geo. Ruhlen, salary | | 500 00 |
| For Assistant Prof. of Industrial Art, Wm. A. Mason, salary | | 1,200 00 |
| For Instructor in French and German Languages, Alice Williams, salary | | 650 00 |

The Board ordered the following minute to be entered on its records in regard to the changes made in the Department of Botany and Horticulture, viz.:

"In the recent establishment of the Professorships of Botany and Horticulture in the University, the main purpose of the Board of Trustees was to develop and reinforce the *practical* side of instruction in the subjects named, and that to furnish the experimental investigation and practical guidance, for which the farmers and horticulturists of the State look to this institution, the Board feels constrained to hold the Professorship closely to the plan of its organization, and *to make practical Horticulture its central feature.* In the retirement of Prof. A. P. Morgan, after a brief term of service in this Professorship, the Board takes pleasure in bearing testimony to his extensive attainments in Scientific Botany, to his unusual skill as a teacher of this subject, and to his high character as a man."

Messrs. Anderson, Godfrey and S. H. Ellis were appointed by the President of the Board, to draft resolutions expressive of the sentiment of Board concerning President Orton's retiracy from the Presidency of the University.

On motion, the Board adjourned to meet to-morrow at 8:30 o'clock A. M., at the office of the Secretary.

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WEDNESDAY, *June* 22, 8:30 O'CLOCK A. M.

Board met. All the members present except Alston Ellis.

Mr. Anderson, as Chairman of the Committee, presented the following, which was unanimously adopted:

WHEREAS, Edward Orton, President of the Ohio State University, to enable him to devote more time to his special department—Geology—has seen fit to tender his resignation as President after a continuous service of eight years; therefore,

*Resolved*, That in accepting it, which we do with unfeigned regret, we feel that words are powerless to express our high appreciation of his faithful, conscientious and able services in behalf of the University.

*Resolved*, That in his special field, which his earnest endeavors, thorough scholar-

ship and practical talents will still further adorn, he should have and will receive our hearty well wishes and co-operation.

*Resolved*, That as a recognition of his eminent labors at the head of our institution, the honorary degree of LL. D. be and the same is hereby conferred on him.

*Ordered*, That $50.00 be and is hereby appropriated to buy specimens for the Geological Museum, and that $75.00 be appropriated for clerical services in the President's room.

The following degrees were, on recommendation of the Faculty, conferred by the Board, viz.:

Master of Science, Curtis C. Howard.
Mining Engineer, Ferdinand Howald.
Bachelor of Arts, Charles M. Lewis.
" " Kenneth D. Wood.
" Philosophy, Josephine M. Bates.
" " Howard D. Pool.
" Science, William K. Cherryholmes.
" " David O'Brien.

Certificates of Proficiency in Civil Engineering, William E. Hawley, John C. McCullough, Jacob D. Streeper.

Prof. Robinson was instructed to place the Mechanical Laboratory in charge of F. D. Marvin during the vacation.

Reports were read and approved, from Prof. McFarland as Bursar, Superintendent of Lawn, and on cost of wind-mill.

On motion, Prof. McFarland was elected Bursar for the next year, at the usual salary, $25.00.

*Ordered*, That the bills of the Farm Manager, of $62.62 for work, etc., on the lawn, and $25.00 to R. W. McFarland, as Superintendent of Campus, be paid.

The Farm Committee, to whom was referred the resignation of C. E. Thorne, as Farm Manager, made report, and the resignation was accepted, to take effect October 1, 1881.

A communication from Prof. Orton, relative to the disposition of the furnace and gas generator, placed by himself in the President's residence, was referred for action to the Executive Committee.

A communication from John Walsh, asking for reimbursement, by sale of certain land, which he claimed was damaged by reason of the dam constructed on the Olentangy River, was read, and, on motion, indefinitely postponed.

Capt. C. A. Barton appeared before the Board, submitting written statements of sales and collections made by him as agent of the Virginia Military Lands, since Nov. 15, 1880, and bill of expenses incurred during

same period; whereupon, on motion, "the Secretary was instructed to settle with Mr. Barton according to these statements; draw warrants on the Treasurer for the amount due Mr. Barton for salary and expenses, and to refer the same to the Executive Committee for examination, and if correct, for verification."

Board adjourned.

JAMES B. JAMISON,
*President pro tem.*